

SUPPLEMENT.

The Mining Journal, RAILWAY AND COMMERCIAL GAZETTE.

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

[The MINING JOURNAL is Registered at the General Post Office as a Newspaper, and for Transmission Abroad.]

No. 2457.—VOL. LII.

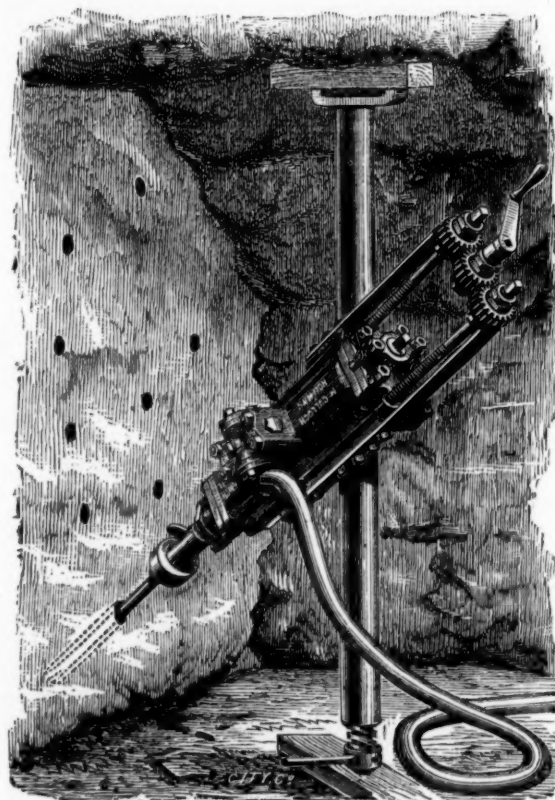
LONDON, SATURDAY, SEPTEMBER 23, 1882.

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McCULLOCH AND HOLMAN'S
PATENT

"CORNISH" ROCK DRILL.



This Drill has been constructed after a long practical experience in the requirements necessary for Mines, and has more than realised the expectations of its inventors. The chief objects in view were **GREATER DURABILITY AND LESS LIABILITY TO DISARRANGEMENT**; but it has also proved itself more **EFFECTIVE AND ECONOMICAL**.

We are now prepared to enter into any reasonable arrangement so as to enable users to judge of its merits, as we are thoroughly convinced that we can offer the **BEST ROCK DRILL IN THE MARKET**.

Further particulars on application to the Makers—

HOLMAN BROTHERS,
CAMBORNE FOUNDRY AND ENGINE WORKS,
CAMBORNE, CORNWALL.

AIR COMPRESSORS AND ROCK DRILLS
SMALL WINDING ENGINES.

SEVERAL OF THE ABOVE FOR SALE AT LOW PRICES.

WARSOP AND HILL,
ENGINEERS, NOTTINGHAM.

PATENT IMPROVED
"INGERSOLL ROCK DRILL."
MEDALS AND HIGHEST AWARDS
SEVEN YEARS IN SUCCESSION
FOUR IN ONE YEAR.

American Institute, 1872.
American Institute, 1873.
London International Exhibition, 1874.
Manchester Scientific Society, 1875.
Leeds Exhibition, 1875.
Royal Cornwall Polytechnic, 1875.
Rio de Janeiro Exhibition, 1875.
Australia Brisbane Exhibition, 1876.
Philadelphia Exhibition, 1876.
Royal Cornwall Polytechnic, 1877.
Mining Institute of Cornwall, 1877.
Paris Exhibition, 1878.

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SIMPLICITY in CONSTRUCTION.
AUTOMATIC FEED
(Perfect success)
GREAT STEADINESS.
GREAT POWER.
GREAT DURABILITY.
GREAT EFFECTIVENESS.



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60, Queen Victoria Street, London, E.C.,
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DUSSELDORF WROUGHT
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Estimates given for Air Compressors and all kinds of Mining Machinery. Send for Illustrated Catalogues, Price Lists, Testimonials, &c., as above.

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NORMANDY ROCK DRILL.
NORMANDY AIR COMPRESSOR.

THESE PATENT MACHINES ARE VALVELESS.

RESULTS OF TRIALS at CARDIFF EXHIBITION, on a block of Cornish Granite, on 24th September, 1881:—

	Inches.	min. sec.
Normandy Rock Drill and Air Compressor, bored	1 1/4 x 10 1/2	in 2 10
Eclipse Rock Drill and Reliance Air Compressor	1 3/8 x 10 1/2	in 2 25
Beaumont Rock Drill and Sturgeon's Trunk Air Compressor	1 1/2 x 7 1/2	in 2 30

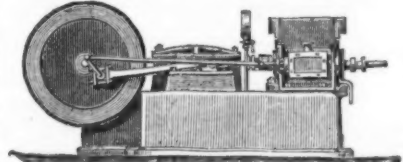
Normandy's have **WON TWO GOLD MEDALS** at the Melbourne Exhibition, 1880, and being the simplest, ARE MUCH THE CHEAPEST in first cost and in repairs.

A. NORMANDY, STILWELL, & CO.,
OPPOSITE CUSTOM HOUSE STATION,
VICTORIA DOCKS, LONDON, E

THE PATENT
"ECLIPSE" ROCK-DRILL

AND
"RELIANCE" AIR-COMPRESSOR

PRIZE MEDAL,
HIGHEST AWARD.



PARIS EXHIBITION
1878.

ARE NOW SUPPLIED TO THE
ENGLISH, FOREIGN, AND COLONIAL GOVERNMENTS
And are also in use in a number of the
LARGEST MINES, RAILWAYS, QUARRIES, AND HARBOUR
WORKS IN GREAT BRITAIN AND ABROAD
FOR ILLUSTRATED CATALOGUE AND PRICES; apply to—
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THE
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HOSKING AND BLACKWELL'S PATENT.



The DRILLS are exceedingly STRONG, LIGHT, SIMPLE, and adapted for ends, slopes, quarries, and the sinking of shafts. They can be worked by any miner.

SUPPLY their CELEBRATED ROCK DRILLS, AIR COMPRESSORS, &c., and all NECESSARY APPLIANCES for working the said Drills.

Their DRILLS have most satisfactorily stood the TEST of LONG and CONTINUOUS WORK in the HARDEST KNOWN ROCK in numerous mines in Great Britain and other countries clearly proving their DURABILITY and POWER.

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BONUS ALLOWED TO INSURERS AFTER FIVE YEARS
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WILLIAM J. VIAN, Secretary

FIRST AWARD.
SYDNEY, 1879.

BICKFORD'S PATENT FUSES

FIRST AWARD.
MELBOURNE, 1881.



SILVER MEDAL OF THE MINING INSTITUTE OF CORNWALL, TRURO, 1880,
for an Improved Method of Simultaneous Blasting.

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THE INVENTORS, AND ORIGINAL PATENTEES AND MANUFACTURERS OF

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FOR USE IN ALL BLASTING OPERATIONS AND SPECIALLY PREPARED FOR ANY CLIMATE

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ESTABLISHED 1850

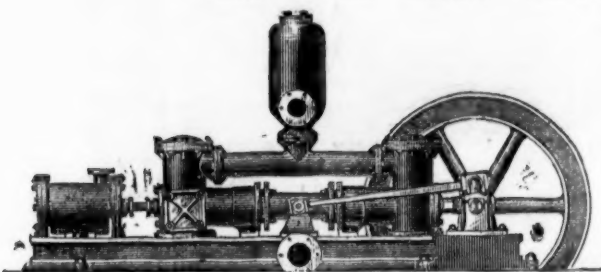
WILLIAM TURNER,

(LATE OMMANNEY AND TATHAM),

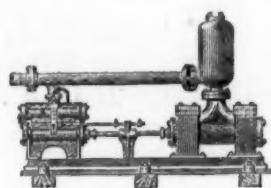
SALFORD, MANCHESTER.

FLY WHEEL PUMPING ENGINES

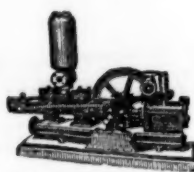
ARE THE ONLY RELIABLE ENGINES FOR STEADY WORK AND ECONOMY.



The "Original" Double-acting Ram Pumping Engine.



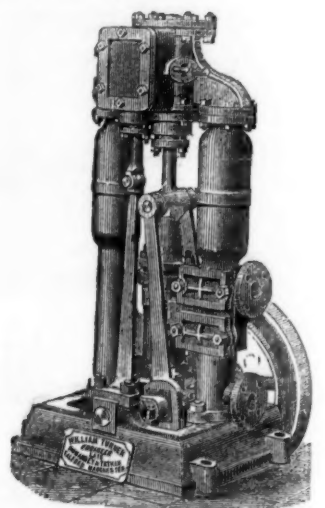
Hydraulic Pumping Engine for Collieries.
Worked by Natural Head of Water, and saving much manual labour.



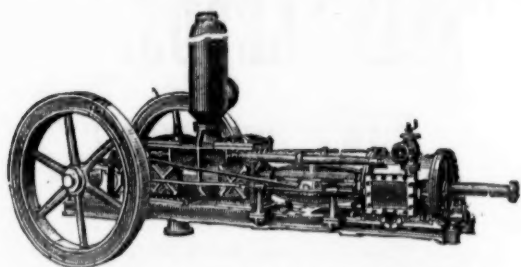
Double-acting Horizontal Pumping Engine.
For Feeding Boilers, Gas Works, Tanneries, Breweries, and all Pumping Purposes.



WIPPERMANN AND LEWIS'S PATENT AIR INJECTOR.
These Injectors are being universally adopted for Pumping Engines for Collieries & Waterworks



The Salford Pump.



Direct Double-acting Piston Pumping Engine.

PUMPING ENGINES of all descriptions.

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HYDRAULIC ENGINES.

VALVES for Steam, Water, &c.

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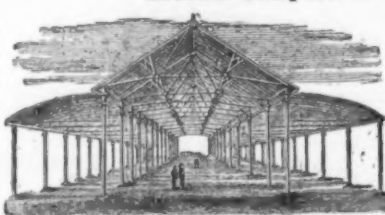
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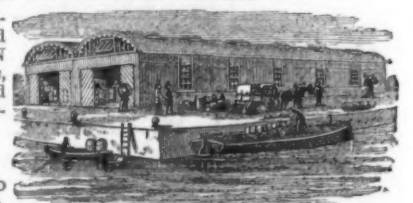
Forges, Rolling Mills, Puddling Sheds, Ironworks, and Collieries

Erected Complete in this Country, or prepared to Plan for Erection Abroad.



OPEN SHED FOR COVERING LARGE AREAS.

GALVANISED OR PAINTED CORRUGATED IRON ROOFING PLATES and TILES. HEAVY CORRUGATED IRON PLATES for fireproof floors, roadways, parapets, &c. (for producing which F.M. and Co. have recently laid down powerful Hydraulic Machinery). Wrought-iron T. Guttering, and General Constructive Wrought Ironwork.
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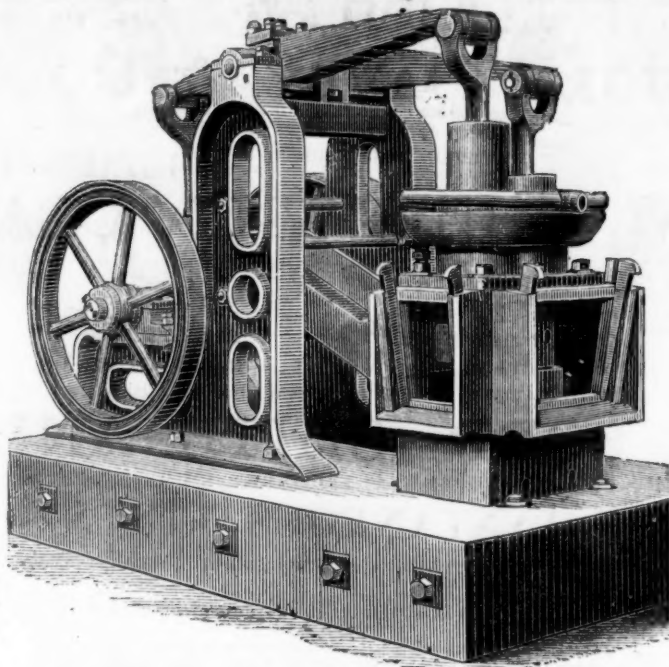
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DUNHAM'S
AMERICAN SPRING BEAM
ORE STAMPS.

COMBINING ALL THE FEATURES WHICH
EXPERIENCE HAS BROUGHT ABOUT IN REDUCING

GOLD QUARTZ.

These Machines are guaranteed to
reduce more Quartz with less applied
power than any Machines in the market.



THIS MACHINE CAN BE SEEN
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INVITATIONS WITH
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N.B.—Quartz from abroad reduced
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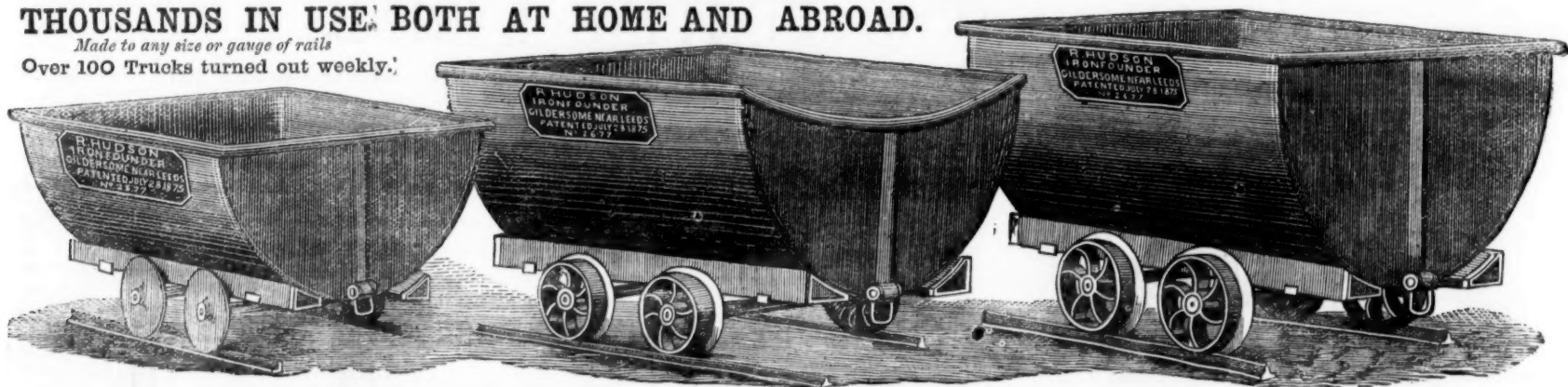
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THOUSANDS IN USE BOTH AT HOME AND ABROAD.

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(ESTABLISHED 1790).

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Manufacturers by STEAM POWER of all kinds of Wire Web, EXTRA TREBLE STRONG for
LEAD AND COPPER MINES.

Jigger Bottoms and Cylinder Covers woven ANY WIDTH, in Iron, Steel, Brass, or Copper
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PERFORATED IRON, STEEL, COPPER, AND ZINC PLATES IN VARIOUS DIMENSIONS AND THICKNESSES.
Shipping Orders Executed with the Greatest Dispatch

GOLD MEDAL AWARDED, PARIS EXHIBITION. 1878.

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MINING STEEL of every description.

CAST STEEL FOR TOOLS. CHISEL. SHEAR. BLISTER. & SPRING STEEL
MINING TOOLS & FILES of superior quality.

EDGE TOOLS, HAMMERS, PICKS, and all kinds of TOOLS for RAILWAYS, ENGINEERS, CONTRACTORS, and PLATELAYERS
LOCOMOTIVE ENGINE, RAILWAY CARRIAGE and WAGON SPRINGS and BUFFERS.

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THE "BEAUMONT" PATENT PERCUSSIVE ROCK DRILL.

(BEAUMONT AND FOSTER'S PATENT.)

The "BEAUMONT" DRILL is now
offered to the public.

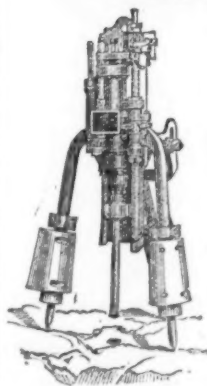
For the last three years it has been solely
used with complete success by the Aqueous
Works and Diamond Rock Boring Company
(Limited), and Messrs. Beaumont and Co.
in their several large contracts.

During this time it has been improved
and developed as to make it without doubt
the best Percussive Rock Drill offered for
Tunnelling, Mining, or Quarrying Work.

Price and prospectus on application to
the Manufacturer,—

JOSEPH FOSTER,
MINING ENGINEER

BOW LANE IRONWORKS
PRESTON, LANCASHIRE.



THE AQUEOUS WORKS AND DIAMOND ROCK-BORING COMPANY
(LIMITED).

CROWN WORKS, GUILDFORD STREET, YORK ROAD
LAMBETH, LONDON.

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Tripods, Tunnelling Carriages, Gadding Cars, Air
Compressors, Air Pipes, and other Mining
Machinery supplied.

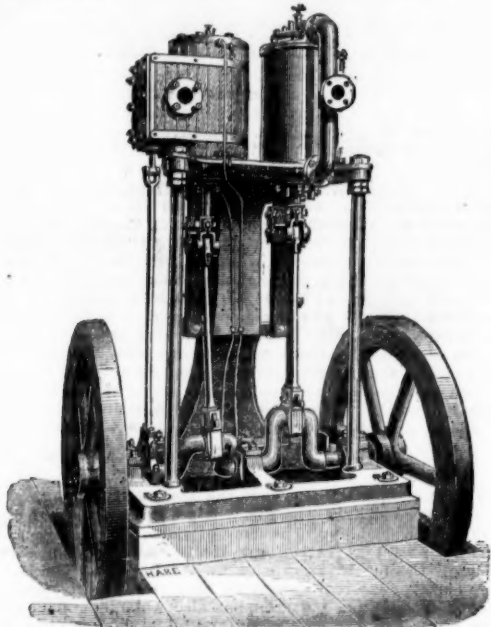
Pumping Engines
for
Mines, Water Works,
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General Purposes.
CATALOGUES ON

PUMPING & MINING MACHINERY. HATHORN, DAVEY, & CO., LEEDS.

Hydraulic Pumps.
Winding Engines.
Air Compressors.
Man Engines.
Capstans,
&c., &c.
APPLICATION.

THE "Champion" Rock-borer AND AIR COMPRESSOR.

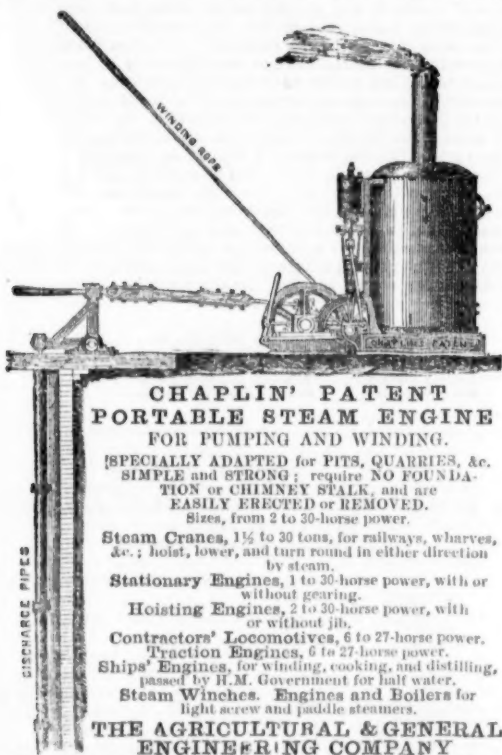
The "Champion" Rock-borer, after several years constant work in Cornwall and other places, has earned an undoubtedly sound reputation. The drivage, rising, stoping, and sinking on the Proprietor's own contract work in Cornwall has now reached 815 fathoms through hard rock.



The woodcut represents the first of these Air Compressors. It has been working in Cornwall from early on Monday morning to Saturday night, each week for nearly two years, with only the attention required for an ordinary good steam-engine. Since this was started on the Proprietor's own contract work, others have been erected in the county, and orders are in hand.

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PRIZE MEDAL—INTERNATIONAL EXHIBITION



CHAPLIN'S PATENT PORTABLE STEAM ENGINE FOR PUMPING AND WINDING.

(SPECIALLY ADAPTED FOR PITS, QUARRIES, &c.
SIMPLE AND STRONG; require NO FOUNDATION or CHIMNEY STACK, and are
EASILY ERECTED or REMOVED.

Sizes, from 2 to 30-horse power.

Steam Cranes, 1½ to 30 tons, for railways, wharves, &c.; hoist, lower, and turn round in either direction by steam.

Stationary Engines, 1 to 30-horse power, with or without gearing.

Hoisting Engines, 2 to 30-horse power, with or without jib.

Contractors' Locomotives, 6 to 27-horse power.

Traction Engines, 6 to 27-horse power.

Ships' Engines, for winding, cooking, and distilling, passed by H.M. Government for salt water.

Steam Winches. Engines and Boilers for light screw and paddle steamers.

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**ALEXANDER SMITH, M. Inst. C. E., CONSULTING
ENGINEER and VALUER of IRONWORKS,
MINING, RAILWAY, ENGINEERING, and other PROPERTY,
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PRIORY STREET, DUDLEY,
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Mr. SMITH has been retained for nearly 20 years by some of the most prominent firms, and has conducted many of the largest valuations that have taken place in the kingdom.

Valuations for Stock Taking or any other purpose upon very reasonable terms.

ESTABLISHED 1860.

HUDSWELL, CLARKE, AND CO., LEEDS.



LOCOMOTIVE TANK ENGINES

OF ALL SIZES AND ANY GAUGE OF RAILWAY.
OF GREATLY IMPROVED CONSTRUCTION
FOR MAIN OR BRANCH RAILWAYS.
CONTRACTORS, IRONWORKS, COLLIERIES.
For Cash or Deferred Payments.

SOLE MAKERS OF RODGERS' PATENT WROUGHT-IRON PULLEYS.

The Only Knapping Motion Stone Breaker and Ore Crusher.

AWARDED THE ONLY SILVER MEDAL FOR MECHANICAL EXHIBITS
AT THE ROYAL CORNWALL POLYTECHNIC SOCIETY,
FALMOUTH, SEPT., 1881.

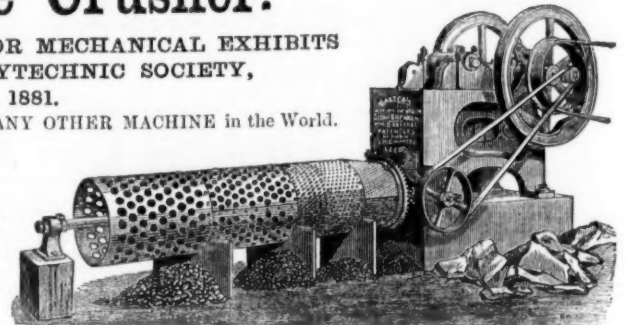
GUARANTEED to do MORE WORK with less power THAN ANY OTHER MACHINE in the World.
READ THIS—

The Bold Venture Lime and Stone Co., Peak Forest,
Messrs. W. H. Baxter and Co., June 8, 1881.

GENTLEMEN,—We have the pleasure to inform you that the 20 by 9 Stone Breaker supplied by you is now working to our entire satisfaction, and we are now able to fulfil our contract with ease, which we had much difficulty in doing before with the Blake Machine. It takes less power and turns out considerably more stone.

Yours truly,

BOLD VENTURE LIME AND STONE COMPANY.



GUARANTEED NO INFRINGEMENT OF ANY OTHER PATENT.

These Machines turn out the same amount of work with less than half the power, and make a better sample of Road Metal, with 50 per cent. less waste than any other machinery, and for Crushing Purposes they are still more advantageous, as the sudden action entirely dispenses with the clogging when used for crushing softer materials, and thereby saves many breakages and a great waste of power. There is also a saving of fully 75 per cent. of lubrication required over the Blake Machine, and as a proof of this, our driving shaft never becomes heated. We are also prepared to guarantee our driving shaft from breakage in any of our Knapping Motion Stone Breakers.

We have already supplied our Machines to Derby, Harrogate, and Falmouth Local Authorities; besides several Quarry Owners, Contractors, Plaster Manufacturers, Mining Companies, &c.

FOR FULL PARTICULARS ADDRESS TO THE PATENTEES AND SOLE MAKERS,

W. H. BAXTER & CO., ALBION STREET, LEEDS.

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THOMAS GREEN AND SON (LIMITED), ENGINEERS, BLACKFRIARS ROAD, LONDON, S.E.

British and Foreign Safety Fuse Company, REDRUTH, CORNWALL,

MANUFACTURERS OF

SAFETY FUSE, FOR MINING AND QUARRYING PURPOSES.



PRICES ON APPLICATION

SILVER MEDAL (HIGHEST AWARD) MELBOURNE, 1881.

JOHN SPENCER,

Tube Works, West Bromwich, and 3, Queen Street Place, LONDON, E.C.

FIRST PRIZE, SYDNEY, 1880.

TUBES AND FITTINGS for Gas, Steam, and Water; Galvanised, Enamelled, and Hydraulic Tubes; Boiler Tubes and Fittings; Gas Fitters' Tools; Brass Cocks, &c.

ANTI-CORRODING TUBES AND FITTINGS COATED BY BARFF'S RUSTLESS PROCESS.

TUBES

INCREASED VALUE OF WATER-POWER.

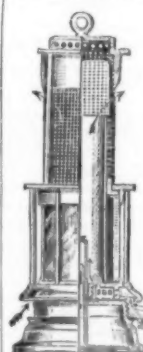
MacADAM'S VARIABLE TURBINE.

This Wheel (which is now largely in use in England, Scotland, and Ireland) is the only one yet invented which gives proportionate power from both large and small quantities of water. It can be made for using a large winter supply, and yet work with equal efficiency through all variations of quantity down to a fifth or even less if required. It is easily coupled to a steam-engine, and in this way always assists it by whatever amount of power the water is capable of giving, and therefore saves so much fuel.

This Turbine is applicable to all heights of fall. It works immersed in the tail-water, so that no part of the fall is lost, and the motion of the Wheel is not affected by floods or back-water.

References to places where it is at work will be given on application to—

**MacADAM BROTHERS AND CO.,
BELFAST.**



ESTABLISHED 1820.

JOSH. COOKE AND CO., SAFETY LAMP

AND
GAUZE MANUFACTORY,

Honourable Mention, Paris Exhibition, 1878.

Illustrated Price Lists free, by post or otherwise.

MIDLAND DAVY LAMP WORKS,

Belmont Passage, 203, Lawley-street,

BIRMINGHAM.

Makers of Williamson's Double Safety Lamp,
Williamson's Patent Double Safety Lamp shown half in
section.

Medal—For Improved Invention—London, Kensington, 1874.
Ditto—Excellence of Workmanship—Wrexham 1876.

Original Correspondence.

CENTRAL RAILROAD COMPANY OF NEW JERSEY SEVEN PER CENT. INCOME BONDS.

SIR,—The continued increase of earnings in this railroad, and the fact that the ordinary shares are quoted at 80, shows the anomalous price of the Seven per Cent. Income Bonds quoted at about 95 per cent. The total of the ordinary shares is \$20,000,000, and the Seven per Cent. Income Bonds \$2,450,000, or less than one-eighth the capital of the ordinary shares. The Income Bonds would appear to be worth buying at present quotations.

B. E.
London, Sept. 20.

GOLD AND DIAMOND MINING IN SOUTH AFRICA.

SIR,—The spread of small-pox throughout the country is causing great uneasiness, and since a telegram was received here from Beaufort West saying "Small-pox has broken out here on the railway; you must look out in Kimberley, you are sure to have your turn," everybody and everything is being vaccinated. But I regret to say one case of vaccination has terminated fatally in the case of Mr. E. Eric Smith, a gentleman of the highest integrity, and one of the most respected citizens in Kimberley. His death, which was extremely sudden, is very likely to deter others from being vaccinated. A local paper writing about vaccination has the following:—

"I do not belong to the Exeter Hall school, and the 'man and brother' theory never met with much support from me; but I do think that it was a scandal that recently vaccinated Kaffirs should have been forced to work in the mine during the late heavy rains. Such treatment would not be given by any decently humane man to his horse or dog."

"Times are bad" is dinned in our ears from morn until night, and the fact of the banks having introduced coppers into the place is looked upon by some as the final consummation of all things. It may serve to convey some idea of the stagnation in our money market when I mention that such shares as the Kimberley Central have dropped to 140%, and such a splendid company as the Standard to 80%. Each of these companies can pay easily 20 per cent. per annum on double the amount. Several companies in Dutoitspan, Bultfontein, and De Beers, have suspended operations, and others are about to follow. In Jagersfontein things are about as bad as they possibly can be. The Imperial Company is in liquidation; the Jagersfontein Company is anxious to dispose of its ground. Several other companies have published statements which show that they barely continue to work.

The ground belonging to a Kimberley gentleman, for which he refused 16,000*l.* 14 months ago, has been seized for a few bags of chaff, and others I could name who have been working their ground on borrowed capital are obliged to surrender their claims because they cannot pay the interest. The Jagersfontein Mine, as I have always pointed out, should be avoided by European capitalists. There is a report that another rich diamond mine has been found near the Vaal river, at a place called Sievonnels. In my last letter I informed you that Otto's Kopje had come to grief, but the prospects are considered so good that the claimholders do not intend to give up without a further trial. The following is from yesterday's Advertiser:—

A meeting of the claimholders in Otto's Kopje on Thursday night, Dr. Murphy in the chair. The meeting was well attended, and great interest was shown in the proceedings. After reading the notice convening the meeting, the secretary read the report of the Provisional Committee, which was, on the whole, very satisfactory. The committee stated that the work in Kopje had been progressing favourably, and that the top ground in one part of the mine paid 3*s.* per load, and in another part it did not average more than half. The first blue ground washed paid 1*s.* per load, but other blue ground only paid 1*l.* The Provisional Committee considered that the mine had excellent prospects of success. The most important business of the meeting was the passing of a resolution to turn the mine into a Limited Liability Company, and to register it under the title of the Otto Kopje Diamond Mining Company (Limited). Messrs. Goch and Cornwall were unanimously elected trustees. Mr. Goch proposed a vote of thanks to the Chairman, and the meeting terminated.

We have had several fires here lately, some of which were evidently the work of an incendiary. The fire brigade rendered valuable service, especially on the premises of Mr. Tarry. Every person here is anxious for the completion of the waterworks, which will eventually—in connection with the railway—make Kimberley and its suburbs one of the most agreeable places to live in South Africa.

Illicit diamond buying is very much on the increase, and it is only natural that such should be the case when the greatest illicit join the protection association, and are frequently appointed as private detectives.

TRANVAAL.—The news from the Transvaal is sensational, and the names of the parties who are so frequently named as the principal promoters of the gold rushes ought to be sufficient to cause persons to exercise more than an ordinary amount of caution before they venture into the pestilential region of the so-called new gold fields. The men who are named as having seen all, or nearly all, the gold at the new gold fields are those who have by some means got hold of large quantities of musty goods, and others who got hold of large tracts of land for a few bottles of grog. The object of those people is to rush in from 10,000 to 20,000 people into the Transvaal regardless of consequences. I have often heard the Transvaal stump orators estimating the value of new comers at 100*l.* each: 20,000 of such people at the present time would be quite a godsend, as it would put in circulation about two millions in cash, independent of two or three millions sterling that the poor unfortunates would in all probability expend in labour. However, it is better to promote bogus gold rushes than to promote native wars merely for the sake of what they can make by supplying the British troops.

I have always informed your readers that there is a little gold in many places in the Transvaal, and that the really best places contain gold in dangerous quantities. At the best it is extremely patchy, and a lead of any kind has never been found. The gold found in the patches is nuggetty and of beautiful quality, nevertheless the character of the Transvaal gold fields is such that where one man makes a bare living, 20 do not earn their salt, and there is not one out of 200 that makes the wages of an ordinary miner in this place. Unscrupulous adventurers may write what they like to the contrary, I say the only persons who are likely to make any money out of those gold rushes are the speculators. I know every part of the Transvaal gold fields, and it grieves me to see men giving up permanent places merely on the representation of men who are known to be unscrupulous adventurers. The following is the latest received here from the gold fields, and to all reasonable men will tell its own tale:—

From the fields we have only a private letter this week, stating that many people are leaving the fields, as they consider it not sufficiently payable. This news is confirmed by others who have come down from the neighbourhood. We may, however, mention that our correspondent above alluded to states that he thinks the richest places have not been discovered yet. Those who are leaving are said to be people not accustomed to gold-digging, who have given up the job now that the surface scraping has been played out. The Pilgrim's Rest people, it is said, are fully satisfied with the prospects. It is also said that another payable creek, 12 miles long, has been discovered, but we mention this only as a rumour. From the diamond fields we hear that a considerable number of people have started en route for the Kaap. It is to be hoped that they will not meet with dire disappointment.

Another account says:—
The news from the new gold fields is meagre; but the diggers are still satisfied with their prospects and their finds. Many of the Boers are leaving, because the work is getting too heavy for them, which means that the fossicking is exhausted on their claims, and digging in earnest will now be necessary. Probably, also, the recent rains will necessitate a return to their farms, to prepare the land for next season's crop.

The Transvaal certainly showed some signs of improvement under British rule, but during the two years that the Boers have had the management of their territory they have almost dropped back to the old scandalous state of the days previous to the annexation. The country is really in a miserable condition, and there is no security for life or property. The few who have been trying to enrich themselves at the expense of the public, have, in granting monopolies sold both country and people, and the people who were so anxious to get rid of the English are obliged to cringe to every adventurer who can raise a few pounds to purchase a monopoly.

It is not quite 12 months since I first stood alone in calling the attention of the public, through your valuable Journal, to the rotten basis on which our diamond companies were formed, which I pointed out from the commencement could only end in disaster. In less than one short year my worst predictions have been fully realised. Many of your contemporaries accused me of all kinds of motives for writing as I did, but I wrote entirely *pro bono publico*, and I have

lately had the satisfaction of knowing that my letters have been the means of saving millions sterling to European capitalists. I again repeat, the fault is not in the mines, most of which contain the elements of success, and if our companies had been formed on a proper basis we should not at the present time be passing through such a trying ordeal. In fact, had many of our companies taken my advice in season they would have been able to reorganise, but now it is too late, and a total collapse of our company system appears to me inevitable. The same spirit which induced me to point out the defects in our diamond companies impels me to give the truth with regard to the so-called gold fields.

Kimberley, Aug. 24.

DIAMOND MINING IN SOUTH AFRICA.

SIR,—I am asked by a friend of mine connected with the diamond mines at Jagersfontein to request you to publish the subjoined extract from the Bloemfontein Express, which will give the readers of the *Mining Journal* some additional evidence of the way in which the capital subscribed is prevented from realising the results anticipated. The Express remarks that when the Diamond News asserted, some time ago, that the company system was past mending, it made but one serious mistake in ascribing the fault of the present system to thoughtlessness and haste. This is barely so, at least not as far as our information goes, which warrants the contention that diamond companies are based upon fraud, and conducted upon principles that border upon something very similar. Time will show—we hope this will happen soon—that there never was a more loose way of mismanaging investor's funds than is practised this moment at Kimberley, and especially at Jagersfontein. Irresponsible directors, and equally irresponsible managers, are at the heads of companies which no responsibility could save from the cancer of a fraudulent foundation. Not that we are able to prove the intent of this, but we are certainly in a position to register the fact of claims having been put into companies for amounts which in no way represented anything like their value. We are prepared to say that 3000*l.* and 3500*l.* is a price which had no foundation in a fair or practical proof previously established by any Jagersfontein digger. On the authority of men of experience, who have worked Jagersfontein, we assert that no claim in that mine is at this moment worth 3000*l.*, and taking all this together we consider the companies, as they have been established, a fraud upon the public. But even if they were not—even if Jagersfontein was the best of mines in the world—we have not the slightest doubt that under the present circumstances it cannot possibly be made to pay.

Whatever a manager chooses to place before the directors as a company's finds the latter are bound to accept as such, whilst whatever the directors choose to do with these diamonds, the manager and public know as little of as they have to be satisfied with it. It is asserted that the greater part of these stones are bought by the directors themselves, or by their friends, at rates which may be considerably below or above London quotations, but which are beyond the control of the managers. Whether this is true or not, there is no doubt that few of the companies' finds are shipped, and that they are bought by gentlemen who had the good fortune, and have now the misfortune, to be the directors of companies. To this is to be added a most lively and extensive illicit trade, which is said to pervade all classes and occupations, a corrupt Press that is dependent upon directors and non-directors, and a practice of book-keeping as described by Messrs. Walker and Cox, in last week's Friend, which, if true, shows a state of things utterly undecipherable. Greater swindles than enumerated in all these instances were never known, and were never surpassed except by the barefaced impudence of those directly and indirectly connected therewith, who, after having robbed investors of their money under false pretences, now turn on the banks, the Government, and the Press, accusing the one of oppression, the other of illiberality, and the third of want of sympathy. They have too long enjoyed the support and confidence of all, and have abused it in the grossest manner. All that now remains is that they should be held up to public contempt, and not be permitted to pass before the world as unhappy but honest men, for they are neither.

I may take the opportunity of remarking that my friend will commence the supply of his correspondence direct with regard to the gold and diamond mining industries of the country, according to arrangement in the course of a mail or so.

F. J.
St. Austell, Sept. 19.

THE GOLD MINES OF INDIA.

SIR,—As one interested in gold mining pursuits in Southern India, but having no personal interest in the welfare of the Colar Mines beyond the general one which all possess who wish to see the industry get fair play, I think it as well that your correspondent, "F. K.," whose letter was published in the *Mining Journal* of July 22, should have a prompt reply, and such reply cannot, I think, take a better form than quoting first from the address of the Chairman of the Ooregum Mine, the policy pursued in the management of which is the ostensible object of "F. K.'s" attack; secondly from "F. K.'s" letter, and thirdly giving you the latest information from the mine, which will presumably reach the directors by the mail that carries this letter, unless transmitted previously by wire.

To quote Mr. Malcolm Low's speech at the meeting of the shareholders—"Coming to the question of mining, the main and important points were the sinking of Munday shaft, which was now down 120 ft., and the sinking of the main shaft. The object in view was to get at the lodes at reasonable depths where they might be certain to unbottom all the ancient workings, and might hope to intersect strong lodes (Italics, my own) no longer disordered as at the surface. At the preceding meeting he expressed the hope that their agent would be able to cross-cut to the lodes at a point certainly not below the 150 ft. level, and he was very glad to see that their anticipations in this regard had been verified, as would have been seen from the report, and the agent was about to cross-cut at the 120 ft. level. The No. 7 pit was down 57 ft., and at the 60 ft. level a cross-cut was to be driven to the lode. * * * The Chairman then expressed the hearty appreciation of the board of directors of the services rendered to the company by Mr. Raynar St. Stephens, consulting mining engineer, &c."

To quote "F. K." commenting on the above—"The company acting under the advice of Mr. St. Stephens is pledged to the sinking of this shaft, but it is impossible to lose sight of the fact that Capt. Bryant, whose career as a thoroughly practical miner is well known, most emphatically condemned this course, &c. * * * In a letter from the late superintendent, which appeared in the *Mining Journal* of March 11, the reasons for the proposed abandonment of this part of the mine were given; and when I compare the reasons given there with the theoretical observations of Mr. St. Stephens I feel bound to record a verdict in favour of the practical miner."

After some ironical remarks on the subject of people calling themselves mining engineers, and in the early part of his letter a futile attempt to show that good men and true have been warned off the field, which would have been better omitted, as the list includes known incapables, and is therefore by no means complimentary to the one or two good names amongst them "F. K." winds up with the following plaintive wail—"I trust for the true interests of gold mining these reckless experiments may not be repeated." You will note that I have taken the liberty of altering the punctuation as it appeared in the *Mining Journal* of "F. K.'s" letter, but not, I think without good cause. Whether "F. K." had good cause to emphatically condemn the course recommended by Mr. St. Stephens, whether the late superintendent, whose letter appeared in the *Journal* of March 11, was in any way qualified to give an opinion on the respective merits of such well-known men as Mr. St. Stephens and Capt. Bryant, or whether he was justified in calling the course decided upon reckless experiments, the information given below will best show.

Certain it is that Mr. St. Stephens has had a very considerable amount of experience in gold mining in different parts of the world, whereas Capt. Bryant, from whose professional capabilities as a practical miner I have no wish to detract, had none. The result, therefore, of adopting the theories of the more experienced man is that practice has proved his theories right, and the directors of the

Ooregum Company will have the pleasure of informing their shareholders that Capt. Eddy, who some 10 or 12 days ago took over charge of the works of that mine from Mr. St. Stephens, has, after prosecuting the work on the lines laid down by Mr. St. Stephens, reported to his directors that he has cut the lode in the main shaft at the 100 ft. level at 4 fathoms, and at time of writing had gone through 12 ft. of quartz without reaching the footwall, washings showing gold throughout.

In the Munday works, as previously recommended by Mr. St. Stephens, Capt. Eddy finds the lode going north to be 4 ft. wide, carrying visible gold in the quartz, and the gangue carrying very good washings. They are rather troubled with water at present, but the level being driven from the 120 ft. level in Munday's shaft, which should cut the lode in about 4 fms., should relieve them of that, and admit of sinking and rising on the lode. Where the lode has been cut in the drive from the main shaft it will give further support to Mr. St. Stephens' claim to know something more than "F. K." gives him credit for, as Mr. St. Stephens predicted that the lode would come into the shaft at about 150 ft., whereas the present position of affairs would go to show that the lode will come into the shaft at about 130 ft. Of some 400 lbs. of stuff tested by assays and washings taken from a lot of about six tons that have been brought to bank whilst sinking, the result has been a general average of not less than 2 ozs. to the ton. And as regards No. 7 pit alluded to in the Chairman's speech, a level driven east to cut the Champion lode has in about 2 fms. cut several small seams of quartz which pan out favourably. Further remarks on "F. K.'s" production are unnecessary, and it is to be hoped that in future "F. K." will confine his remarks to subjects of which he may have some slight knowledge.

Bangalore, Aug. 23. A SUBSCRIBER.

MYSORE REEFS GOLD MINING COMPANY.

SIR,—I have read with interest the correspondence which you have published between Col. Blair and Mr. John Clare, who I understand to be one of the committee of investigation, and I have no knowledge of their report having been considered or placed in the usual course before the shareholders. There certainly seems a heavy charge resting on the original directors, all of whom have "cleared out" except Col. Blair; and Mr. Peter Watson's connection seems to have quite ceased though his advocacy and name no doubt influenced most to join. As Mr. Clare seems simply to ask a question which would not affect the amalgamation of the company or otherwise, and only requires yes or no, I certainly think Col. Blair's letter very unsatisfactory, especially when he says he "courts every enquiry," and as the voting power of the vendors' and promoters' shares is so greatly in excess of the 45,000 actual 20*s.* shareholders I hope these at least will not give any support to Col. Blair unless he agrees to an enquiry such as Mr. Clare asks for, and as I think very properly. I cannot see that Mr. Clare can have any other interest than the benefit of the shareholders, and therefore his action is on the same line with Col. Blair's stated policy, and would relieve Col. Blair, if innocent, from the present stigma which seems to attach to him as one of the original directors.

SHAREHOLDER.

INDIAN GOLD MINING.

SIR,—On reading the reports in the *Journal* of the various Indian gold mining companies, the first thing that strikes an Australian reader who has had any experience of gold mining here is the evidently utter want of practical knowledge by the working managers, and of all theoretical knowledge by the directors, and they can hardly hope for any real success at all until they import not only skilled managers from Australia, but also Australian made crushing plants, or at least the special sort of tables, blankets, ripples, and buddles, which have finally approved themselves as the best gold savers, for it is not in the mere crushing that success consists, but in the saving of the finer gold as it passes through the gratings of the boxes, and of the pyritous portions in the tailings. In these colonies, and probably therefore also in India, the reefs vary in the minerals mixed in with the gold according to the country they are found in; and the manager who could save within 5 per cent. of the gold in the stone in one district could not (at first going off) save within 20 per cent. probably in the adjoining district if the quartz was a little different in its constituents. With one sort of stone it pays to put mercury in the stamper boxes themselves; with another it does not. Some quartz yields best if calcined first; with other kinds it would lead to a loss of nearly all the gold in it, and so on, just according to what sort and in what proportion the inferior metals are also present. The probability is that there are at least three or four distinct varieties of quartz in the various Indian mines, and there is also a great probability that on comparison they would be found of pretty much the same nature as a like variety of our Australian mines, each of which with us is treated more or less differently, as long practical experience has at last proved to be the most profitable; and now that it seems the Indian ones are beginning to be really worked it would only be the commonest prudence on the part of all of them if they jointly secured the services of some first-rate Victorian manager (certified to by the Victoria School of Mines) to carefully inspect the stone in each mine and the plant used to work it, and if he found it like the colonial kinds to adopt the like treatment. Or another course could be adopted. Let each mine send a few tons (separately of course) either to Melbourne or Sydney, addressed to the Minister for Mines, requesting his opinion (or rather that of his scientific officers) as to the general nature of the stone, and also the best sort of machinery for seeing the best results from it, as some stone requires light and other heavy stampers, also finer or coarser gratings to the boxes according to circumstances; and although our department is tolerably well over-worked with its own business I feel but little doubt that it would strive a point and give all the assistance in its power, only charging the cost of crushing and treatment, &c.

I see one company is very jubilant on the strength of its prosperity adjoining another one where gold is being got, evidently at once taking it as a matter of course that it must also run through their lodes. It is by no means a matter of course. Rich gold (i.e. 2 ozs. or 3 ozs. and upwards) is nearly always found in shoots of ancient width and depth, and where there are more than one with 50, 100, or it may be 1000 ft. between them of poor stone, payable perhaps (perhaps not). The most equally diffused gold is where it runs from 5 or 6 to 10 or 12 dwts. per ton, and occasionally up to an ounce or two, and it is these equal reefs which pay best as a rule provided the working expenses are easy. I have known a lode only 2 ft. thick pay well at 7 dwts., and I have known one of the same size sink money at 12 dwts., simply because of extra cartage, harder country, less water, &c. A really payable reef of this kind ought to be not less than 3 ft. thick, and even with that and all labour appliances favourable it will take at least 4 to 5 dwts. to pay bare expenses, and then the gold must be good—i.e., not blent with silver and copper, as I have seen gold fetch as little as 1*l.* 17*s.* 6*d.* and as high as 4*l.* 3*s.* according to its quality. Of course if these poor reefs are very large then the cheapness of working them and the great quantity put through a large mill pays well. For instance—Mr. B. O. Holtermann, of Sydney, whose mine at Hill End, in 1871, was something wonderful for its richness (blocks of it being more gold than stone) is yet quite satisfied to have just discovered and opened up about a mile long of gold-bearing reefs (at Molongolo, New South Wales) varying from 5 to 15 ft. thick, and expected to go from 5 to 8 dwts. per ton, but then if the 10-head battery just erected proves 2000 or 3000 tons of the stone is up to that standard generally, and the reef opens out so as to also prove there is quality, he will then put up a battery of 50 or 100-heads, and the poor reef then simply grows into a mint on a decent scale.

I see also in the Indian reports great stress laid on assays. There is nothing so misleading as to practical profitable results, for the assay shows all the gold, both free and pyritous, whilst the crushing only gives the free gold and the saving, and after treatment of the pyrites is pretty much an unknown quantity as to final result.

The Goodrich (copper pyrites and some little free gold) assayed 11 to 13 ozs. gold per ton, but the yield of free gold from the battery was (steadily) only about 1½ to 2 dwts., and even when it is all free gold (a very rare thing), if the assay shows 3 ozs. and the stampers 1 oz., it is a splendid result. Also some of the steadiest paying reefs

are those where scarcely a trace of gold is to be seen, and I know of one now, yielding over 16 dwts. and giving good dividends for years past, where not a speck can be seen even with a powerful microscope, and it is more than likely that a large proportion of the refuse stone left by the previous fossickers in the Indian mines would pay well for crushing if the manager only knows how to save the gold in it (if any). One thing, also at least, is certain that the shareholders are too impatient for results. Why, it often takes our practised miners a year or two to open up a mine, to get out a crushing, and sometimes after following the gold down for 300 or 400 ft. it breaks, and does not make again for another 100 ft. or more, and as when gold is once found in a reef it generally runs through it more or less, and as in Victoria they go on finding it payable at 2000 ft. deep even. Why the holders of Indian mines should consider that they are only just beginning, and should not lose heart in working any reef that has shown gold until at least 300 or 400 ft. down without any sign of it at all, and even then it is more probable than not that it is under foot, and richer than ever it was at the top.

Sydney, N. S. W., August. R. D. A.

MINERAL RESOURCES OF QUEENSLAND.

SIR,—The readers of the *Mining Journal* will be gratified to learn that the favourable anticipations from time to time expressed with regard to the mineral resources of this colony are being fully justified by results, although mining is here still a neglected industry. Upon this subject I may refer to an able letter by Mr. C. H. Manton, recently published in the *Melbourne Argus*, in which he points out what he has recently seen with respect to mining industries in Queensland, especially the northern parts of it, during a lengthened tour and some term of residence in the colony. I feel, he remarks, convinced that the greater portion of even the known mineral resources of that exceptionally rich country are now practically dormant, owing to a lack of plant and appliances to wrest fortune from the grasp of Nature. A recent correspondent in the *Australasian* in describing a trip to Gympie, instances many mines in the south as abnormally rich, but I assert that their importance will pale before that of the mineral lands of the northern districts. Newspaper reports can give only a moderate idea of the riches actually discovered, as the vast extent of country prospected, though not yet actually in work, and in some cases the remoteness of the localities, render it impossible that any reliable information as to details can come to the papers. My journey took me through Townsville to Charters Towers, Ravenswood, and the Star, Etheridge, Gilbert, and Cloncurry Rivers. At Ravenswood and the Star River the silver lodes in various ores are developing daily to such an extent as to create intense local excitement, and if judgment and skill be used in their development the results promise to be of the grandest description. On the Cloncurry River the great copper mines, although not yet in active work, are opened up to show immense deposits, the Great Australian, the Leichardt, and the Mountain Home Mines being especially prominent as of wonderful richness. In the latter mine the lode can be seen for 300 or 400 yards in length and 40 ft. in height, in the face of a hill denuded of outer soil, and has been traced in the shaft down to 80 ft., showing at that depth a width of 25 ft. Thousands of tons of 50 and 60 per cent. ore are thus virtually on the surface, and other mines are almost as valuable, although the lodes are not as apparent on the surface. The Charters Towers gold field is well known, but I venture to assert that the chief richness of that and other Northern Queensland fields will evidently be found to be contained in the mundie.

Appliances for scientifically treating the mundie are unknown in Queensland, but careful trituration has yielded excellent results, even after the usual crushing of the quartz has yielded a profitable return in free gold. At Ravenswood I have seen mundie stone assayed yielding at the rate of 295 ozs. of gold to the ton, the stone showing no gold to the naked eye. But the Etheridge district seems destined more especially to astonish the mining world by the extraordinary richness of its yields. One mine there, the Cumberland (which rivals the great Day Dawn at Charters Towers), has a reef 3 ft. to 14 ft. wide, yielding steadily 3½ ozs. to the ton, and the crushing for May, 1882, produced over 1800 ozs. of free gold apart from the pyrites. Here again, the feature is mundie, or iron pyrites mixed with galena, &c. The lodes in many instances change to this mineral mixture in the solid, and I have seen many assays which show that this pyrites contains from 10 ozs. to 300 ozs. per ton of lode as raised. It is claimed by those who have been watching this field that an average of at least 20 ozs. per ton from the pyrites in addition to the free gold may be expected. In these back districts but little machinery has yet been available, while the supply of labour has been by no means steady, miners coming spasmodically and leaving just as the fancy takes them, as new discoveries are made within any reasonable distances. The Cumberland was working last year with eight miners only, and yet it turned out 7000 ozs. of gold, leaving a large quantity of rich pyrites still available for reduction. I cannot speak from personal knowledge of the tin discoveries, as I did not go through that part of the country; but I am convinced from what I have seen that it is simply a question of a little time when Victorian capital and enterprise will find its way to Northern Queensland, and that within a few years enormous fortunes will be made from the effective treatment of the vast quantities of pyrites which will be extracted from mines there, as well as from the other minerals known to exist in such abundance in Queensland.

Mr. Manton's views are quite borne out by the official details constantly coming to hand here. The report of the Department of Mines for the year ended December, 1881, recently presented to Parliament, is highly satisfactory, inasmuch as it shows that, notwithstanding a large decrease in the yield from Palmer and Hodgkinson gold fields, the total output showed an increase of 3819 ozs. on that of the year 1880. This is accounted for by the extraordinary yield of 24,789 ozs. from Gympie. The returns show that there were in all 3375 quartz and 991 alluvial miners, exclusive of Chinese, who numbered 4048. As compared with the previous year, this is a decrease of 683 in the number of Chinese and an increase of 775 Europeans. A table contained in the report giving the amount of quartz crushed on each field, and the gold obtained, that about 120,000 tons of quartz was crushed, and gave a general average of 1 oz. 11 dwts. 20 grs. per ton, as against 1 oz. 11 dwts. 12 grs. per ton in 1880.

GYMPIE.—Warden Lukin reports that during June the Great Eastern and the Monkland and Abyssinia Companies have struck good gold. There is also a decided improvement in the Never Mind and Russell Company's Mine, fair gold having been met with. No. 1 Phenix maintains its reputation, and still gives handsome dividends to its shareholders. The Phenix p.c. is also improving, and promises to recoup its enterprising shareholders for their outlay of capital in the way of additional and improved machinery. The monthly return of crushings is somewhat smaller than usual. There were 11 concerns which between them crushed 3380 tons for 3450 ozs., 5 dwts. 6 grs. of gold, being an average of 1 oz. 10 grs. per ton. Later reports are still more favourable. The last says:—The crushings cleaned up during the week comprise the following parcels of stone—400 tons from No. 1 North Phenix yielded 1223 ozs. 15 dwts. 6 grs. smelted gold; 632 tons from the Phenix p.c., 657 ozs. 11 dwts. The whole of the crushing machines on the field are now in full swing.

CHARTERS TOWERS.—Warden Selheim writes that during June 4147 tons 8 cwt. of quartz have been reduced for 5712 ozs. 2 dwts. of gold. The average, 1 oz. 7 dwts. 13 grs. per ton, is not equal to our usual standard; but it is owing principally to the gold robbery at the Excelsior Mill, when the produce of 290 tons of quartz, amounting to about 500 ozs., was stolen. The gold escort was dispatched on June 16 with 10,045 ozs. 12 dwts. and 23 grs.; but about 4000 ozs. were left behind, as some of the banks refuse to send unless they have a certain quantity. There were five mills at work, and 4147 tons 8 cwt. crushed for 5712 ozs. 2 dwts. of gold, showing the average already stated.

THORNBOROUGH.—Warden Towner reports that during June 995 tons 7 cwt. of quartz were reduced on this gold field, which yielded 1005 ozs. 14 dwts. of gold, being an average yield of 1 oz. 1 dwts. per ton. The two best crushings were from the Tyrconnel and B. B. Mines—464 tons 11 cwt. from the Tyrconnel, yielded 563 ozs. 17 dwts., and 143 tons from the B. B. yielded 161 ozs. 15 dwts. The Home-

ward Bound Gold Mining Company are busy raising stone, and will have a large quantity to put through by the end of July. A good quantity of fair stone is being obtained from the Home Rule Mine, and the manager, Mr. Beattie, speaks very favourably of the future prospects of the company. Wages men seem to be scarce on the field now. The owners of Gold Mining Lease No. 39, Mount Trial, have been compelled to employ Chinese to represent their leasehold, European miners not being obtainable. The Mulgrave gold field is almost deserted, only 10 miners are employed at the upper camp, and only two mines being worked at the Lower Camp, Goldsborough. Since the Upper Mulgrave Quartz Crushing Company's mill started work three months ago 252 tons of stone have been crushed for a return of 290 ozs. of gold. The crushings have been from the following mines:—54 tons from the Mowbray p.c. gave 54 ozs. of gold, 50 tons from the Mabel p.c. yielded 74 ozs., 61 tons from the Orient p.c. yielded 74 ozs., 35 tons from the Mowbray p.c. gave 35 ozs., and 53 tons from the Scandinavian p.c. yielded 53 ozs.

What few miners are now left at the Upper Camp are dissatisfied and likely to leave. There is about 120 tons of stone at grass on the various claims, and when this is crushed the mill will most likely be hung up for a few months. Warden Towner adds: I am of opinion that the reefs in the Mulgrave will give a steady and remunerative yield, and some day support a large population. Owing to the length of time before crushing mills are available for the reduction of stone, the amount of labour required to make roads from the mill to the different mines, the counter attractions elsewhere, and the notion that miners have got that no big rises will be speedily made there, I fear that what few claims are being worked will either be registered or abandoned.

GEORGETOWN.—Warden Mowbray forwards lists of stone crushed on the Etheridge gold fields during the past two months, the returns for May showing a yield of 982 ozs. 15 dwts. from 710 tons of quartz, and that for June 1738 ozs. 3 dwts., from 1040 tons; to these yields the Cumberland lease has contributed a total of 1144 ozs., from 440 tons crushed, and has again cleaned up during the present month 350 ozs., for 140 tons. Since his last report a considerable number of miners have arrived on the field, and there is now no scarcity of labour. At the Gilbert over 400 Chinese are working the lode at the river from Gilbert to about 50 miles lower down. Five men employed by the Gilbert Gold Mining Company are the only men engaged in quartz mining, the other miners being unable to get their stone crushed at the company's mill have been compelled to leave their claims. An escort was dispatched from Georgetown on May 26 with 7155 ozs. of gold, making a total escort for the half-year of 10,623 ozs. 13 dwts.

Brisbane, Aug. 5.

MINING IN NEW SOUTH WALES.

SIR,—As there is English capital now being invested in Fairfax claims at Hill End, New South Wales, the following progress report may possibly interest some of your readers and the investors therein.—Deeper sinking in Victoria has almost unusually proved the permanence of the gold-bearing stone at great depths, even when it has sometimes become barren for a few hundred feet down, therefore Mr. Fairfax has every right to expect like results in these mines, especially as the ordinary run of gold has never been lost at all, but only the enormously rich patches which made the fortunes of the former owners in a few weeks:—

THE HAWKINS HILL CONSOLIDATED GOLD MINING COMPANY.—Since last report of the above company, of having taken over the Star of Peace and tributes, a large amount of work, both on the surface and below, has been done; but owing to the difficulties of obtaining the varied kinds of labour, coupled with the scarcity of carriage, suitable timber, and the great impetus of late to mining in this and the other colonies, which has drawn away from this district many of the best miners, not easily replaced; in addition to which the demand for mining machinery, and work connected, is so great that the manufacturing of New South Wales and Victoria will only accept the work at increased rates and extended time, these conditions have caused considerable delay in getting the plant into full swing. The first work of importance that engaged our attention was the water supply. This has now been accomplished by so enlarging the dam that an ample supply has been secured for crushing purposes. We have also completed extensive excavations, to admit of doubling our battery power, and to give space for the erection of shop and sheds for engineering purposes, so that all work connected with that department can be carried out on the mine. The various discharging engines, and battery engine, tables, and pump, are being thoroughly overhauled, and a more perfect system (much needed) introduced, both for saving labour, fuel, and gold. A contract for scantling, for cages and tanks, for the main shaft has been made, and a powerful winding engine cabled for, capable of winding with ease and dispatch to a level of 1200 ft. Mr. Parrot, mining surveyor, has been for the past week, and is still, occupied in making surveys of the whole of the surface accessible, and underground work, which will enable him to make a complete set of working plans, and show as far as possible the various shafts and gold worked. This will probably furnish a valuable clue in picking up the lost, as well as supplying a guide to the new run of gold on the hill. His survey will include a surface tramway for the transit of quartz from Krohmann's Amalgamated Company, recently purchased by this company, and connect with our own battery, and thus avoid the enormous cost of packing and carting encountered by that company. Immediate operations will be commenced to sink Krohmann's north shaft and work the ground known as Beyers and Holtermann's, which has proved so productive in the past. As soon as the water, now up to the 500 ft. level, can be got out of the foot to the hanging wall, here the vein exists in rolls, varying from 4 to 10 ins., which shows fair gold and other minerals, the usual associates of productive stone. At present we are following the shoot by an uprise, but it is intended to test the ground beneath by a winze. The vein shows fair gold for about 50 ft. along the drive, and from its favourable appearance, should prove both extensive and profitable. The new shaft has been sunk, timbered, and laddered an additional 60 ft., making a total depth of 290 ft., from which extensive drives and cross-cuts can be readily worked. In a 60 ft. west, at 230 ft., a rise has been put, showing fair gold, and in places 20 in. wide. This vein is in the vicinity of the cross-course and a large blow, and, if the gold continues, will yield a large quantity of quartz. Back-stopping at the 100 ft. level, on the Frenchman's vein, also payable stone. Have 140 tons of stone at surface, waiting completion of the battery.

The manager of the New Reform Gold Mining Company (Limited), under date Lusknow, July 13, reports that:—The industry and perseverance veins in No. 1 shaft show no inclination to draw in, and are consequently producing similar large quantities of crushing material to that previously reported. The Uncle Tom vein in No. 2 shaft still continues its unprecedented width and length, the whole of which gives profitable employment to the battery; but the dyke must draw in considerably before bulk stone of any consequence can be expected. I think I am justified in saying that, this evening, the trace of an indicator to the presence of a Bonanza underfoot has transpired in the extreme eastern portion of the dyke. It is hardly sufficiently defined to report positively upon; at the same time, the appearances are very favourable, and worth mentioning. I shall have to report fully on this tonight or three days hence, estimating the value of the phenomenon in the shape of a quartz reef, reported in my last as coming into the dyke at the western extremity, as I have to take out a large quantity of dyke material from the front, preparatory to stopping back at a 10 ft. deeper level. All the machinery is working well, and tenders have been called for the additional crushing appliances required.

The New Reform Company is a Victorian one, being a small lease out of the celebrated Wentworth Freehold Estate, at Lucknow, near Orange, and as the Victorians are far ahead of us in practical quartz mining, great things are expected of this claim within the next year or two, for on this property, like Hawkins Hill, also, tons of fine gold were taken out of the shallow levels.

VOLETABLE CREEK, JULY, 1882.—Flannery struck a splendid tin mine a chain north from his main shaft. It is supposed to be a continuation of Fox's run. The vein is 60 ft. deep, with 2 ft. wash, half tin.

EVERILL.—The recent increase in the price of tin has caused a stir on the tin fields. The Buckwood Company looks better than ever.

TEMORA.—Mr. Wren, the mining expert, now at Temora, visited Hefferman's reef on Thursday, with a view to float a company in Sydney market. The South Australian Company are raising stone from the Fanny Parrell claim. The company are sinking a new shaft on the Shamrock line. The Adelaide Company are sinking a shaft on Whelan's ground, and preparing to sink on gold-bearing spurs, cutting the eastern cross-cut from Head and Aldridge's. Mining news is dull. Boyd and party have struck a good reef, but it is not opened up yet. The Double Whiff shaft Company's crushing is not so good as was anticipated, but a good reef exists in the claim. They are now down nearly 300 ft., and driving westerly. Martin and party are driving for the reef. This claim was abandoned about a month ago. A half share in the Flery Cross, Barmindam, changed hands at a high figure to some Wagga speculator. It is likely that the Selastopol Reef will be floated by Melbourne capitalists. Negotiations for floating the Hard-to-Find Reef, Barmindam, have fallen through.

CARCOAR.—The monthly escort left to-day with 1121 ozs. 18 dwts. 18 grs. gold, which includes 625 ozs. 18 dwts. 18 grs. from Mount McDonald. Corry and Kane's party, at Galley Swamp, cleared up the plates this morning, after eight hours' work, for about 40 ozs. amalgam. At the Thompson's Creek Copper Mine they have now three furnaces in full swing. Reports continue satisfactory from these.

WILCANIAN.—The Mount Brown coach service has commenced again, and the weekly mail from that diggings arrived to-day. The rain that fell some time

ago did not leave sufficient water to wash more than a small portion of dirt. Thousands of tons have accumulated, and are waiting for rain to wash. Some parties are washing dirt 10 miles from the Tubooma; 350 loads of dirt from the prospectors' claim, Easter Monday, was offered for 350£., without getting a purchaser; 40 loads of it since washed yielded 63 ozs., 40 loads from a heap of 400 got out of another claim gave 2 ozs. per load. There is no scarcity of water for domestic purposes, good water having been got by sinking wells. The Government has promised to send up several diamond drills as soon as they can be got ready. Provisions are plentiful and reasonable in price considering the long land carriage. The rainfall on the diggings for the last eight months was 2 in.

There has also been a re-discovery of rich gold near Orange, at the place where it was first discovered (Ophir), in really golden stone in New South Wales:—

BIG FIND OF GOLD.—Our correspondent at Orange writes:—Saturday evening.—Great excitement was caused in town this evening when it became known that Mr. H. B. Davies, one of the proprietors of the Belmont Gold Mining Company, Ophir, brought into Orange about 1½ cwt. of stone which is estimated to yield over 1200£. worth of gold. This grand find was made yesterday, and is the result of two men's work for 10 days. The owners of the mine are quite jubilant. This is the second rich find in this claim during the past five weeks. The stone is on view at the Royal Hotel, and from its appearance and weight there must be more gold than stone in it. This should cause an impetus in mining in this locality, as I have no doubt there could be more of the precious metal found if properly looked for.

Taking it altogether mining has lately been making a real and steady advance here, and the rapid extension of our new line of railway will greatly help to make the industry a permanent one.

Sydney, July.

R. D. A.

MINING IN SOUTH AUSTRALIA.

SIR,—I am sorry to have to confess that with very few exceptions our gold mines have not by any means realised the hopes or expectations of those who invested in them. These unfortunate results have been matter no less of surprise than of disappointment, because stone to all appearance containing gold in payable quantities has been found in many localities, and assays have shown that the gold did exist in proportions that should have been remunerative. Those best qualified to form an opinion as to the cause of the wide discrepancy between assays or even hand crushing and washing out the gold from the stone pulverised by pestle and mortar, and the work done on a larger scale by the ordinary batteries, consider that as most of the gold in this colony is found amongst iron pyrites, and in a very finely divided state, something more than the ordinary tables with copper-plates and mercury troughs is required to save the gold. This is no doubt the correct explanation of the want of success at present attending gold mining with us. Nevertheless there are some persons who are determined to persevere, and who will probably before long seek out some scientific means of dealing with the refractory pyrites, &c., with which our gold is too intimately associated. The Bird-in-Hand reef continues to turn out very good crushings, keeping up an average of about an ounce of gold to the ton of quartz. Other adjacent mines bid fair to turn out equally well, but are not yet far enough advanced to have given any returns at present.

Copper mining seems more likely to take a fresh start here just now, and some very promising discoveries are announced. In a former letter, published in the *Mining Journal* of June 3, mention was made of a splendid lode found about 20 miles north of Farina, the present terminus of the Great Northern Railway. Since then this lode has been traced for a length of about 4 miles. I intend to visit the locality next week, and will after seeing it send a full description; in the meantime, from all the information I can obtain the lode runs in a direction about N.N.W. between two main ranges of hills about 1 mile apart, a low undulating ridge, or succession of hillocks from 50 to 100 ft. in height from the valley carries the lode, which appears to have a general width of 10 to 12 ft. The ore is chiefly grey oxide, but mixed with green carbonate and oxychloride of copper, and the average percentage is about 35 per cent. of pure copper. Fine stones of 50 to 60 per cent. are frequently met with. A sample parcel of a few tons—a railway truck load—was purchased by the English and Australian Copper Company at Port Adelaide at an average produce of 37½ per cent. of pure copper. Trial pits have been sunk in several places on the course of the lode, and two small shafts, 7 by 4½ ft., have been sunk 1½ mile apart—one to a depth of 20 ft. the other over 40 ft.—through nothing but solid ore of between 30 and 40 per cent. Everywhere the lode appears the same; the low ridge is full of copper, which has merely to be quarried out, so that the cost of raising is a trifle. The recent railway tariff for the carriage of ore reduces the cost of transit to about a fourth of what it would have been by drays before the opening of the railway, and the ore can be delivered on broad ship at Port Augusta for about 3£. 10s. per ton for raising and carriage. The whole country surrounding this great mine contains more or less copper, but the lode described above is said to be the greatest discovery since the Moonta. It is at present in very few hands, and no definite plan for future working has been yet decided upon. When the proposed extension of the railway north to Hergott Springs is carried out—say, in about 18 months—the mine will be within 6 miles of the line. The proprietors are said to be rather in favour of working it themselves without assistance, as the ore can be so speedily made to return a handsome profit. The tin discovery alluded to in my letter of June 3 has not yet been opened, owing to the discoverer being engaged on the copper mine above mentioned, but I have every reason to believe it is a genuine and valuable find. That near Encounter Bay has not turned out of any value.

It has occurred to me that the new Malleable White Bronze, described in the *Mining Journal* of March 24, as patented by Messrs. Reynard and Co., of Paris, and made by smelting together copper and manganese in certain proportions, ought to be brought largely into use in the arts and manufactures. Your description of it would lead to the supposition that from its immense toughness it might be used for the armour-plating of ships of war. The cost per ton would be much greater than that of iron or steel, but its resisting power being also so much greater, the difference of cost would perhaps be not very material. The bronze would possess other advantages of very great importance, 6 in. of armour-plating composed of it being probably equal to 24 in. of iron or steel armour, so that the greater lightness of vessels so plated would be an important improvement. This colony abounds in vast deposits of both metals, and it would probably pay well to establish a manufactory for the Malleable White Bronze in South Australia.

A mine about 12 miles south-east from the Burra is being opened; it is near Apoina, where smelting-works were erected in the old days of the Burra Mine. A large lode of ore shows close to the surface, and is from 6 to 10 ft. wide, the ore assaying from 20 to 35 per cent. A company, with a nominal capital of 30,000£., is being formed to work it, the promoters retaining shares to the value of 10,000£., and taking also 1000£. in cash for their interest. Another copper mine, about 180 miles north of Adelaide, and 25 to the east of Petersburg, on the Northern Railway line, is being opened. A company to work it was successfully floated a few weeks ago.

Adelaide, July 28.

COLORADO UNITED MINING COMPANY.

SIR,—On Aug. 1 I attended the annual meeting of this company, of which I am an old shareholder, when the directors' report and statement of accounts were adopted unanimously. The cash in hand was then 1412£., and considering that the capital of the company is 308,125£., and that the unpaid directors fees alone stand at 2207£., no dividend could have been proposed or expected by the meeting, which passed a special vote of thanks to the Chairman and board of directors, two of whom gave the meeting an account of their last visits to the mine, and everything passed off in the most satisfactory manner. I was therefore extremely surprised to receive the other day a circular from a stockbroker convening a meeting of shareholders, and asking for proxies for the ostensible purpose of enforcing the payment of immediate dividends. I think, with the balance in hand, considering the large capital of the company, whose wages and other payments require to be made monthly, it was obviously impossible for the directors to have declared a dividend, and I hold that they should not do so until they are in a position to pay them regularly and continuously. Besides shareholders should leave such matters in the hands of the board in whom they have so recently expressed their entire confidence; and who, being themselves large shareholders, are no doubt as desirous of dividends as any other shareholder. The last election to the board—Mr. Hamill, who is

also managing director at Colorado—holds 20,000 shares, nearly a third of the mines, and he has neither sold nor jobbed in the shares; is he not as anxious to receive dividends as Mr. Smyth? The circular states that Mr. Hamill receives 1000*l.* a year salary, that only commenced last year, and he previously gave his services gratuitously, and lent money to discharge the debts of the company without interest in Colorado, where 12 per cent., I believe, is the legal rate. The large stake that he and the other directors have in these mines is the best guarantee the shareholders can have for the directors paying dividends as soon as they find they can do so, and they will act unwisely if they interfere with them unduly. I therefore hope they will not sanction such proceedings nor give their proxies to Mr. Smyth. If the board receive fair play it is unlikely that the shareholders will have much longer to wait. I submit, however, that it is neither fair nor in accordance with the facts stated without challenge at the last general meeting to maintain that any unnecessary delay has occurred in making returns to the shareholders. ARGUS.

London, Sept. 20.

COLORADO UNITED MINING COMPANY

The subjoined circular has been addressed to the shareholders by Mr. Archibald Smyth:—

As an original shareholder in this company, who during the twelve years of its existence has always taken a lively interest in its welfare, I desire to solicit your assistance in the object I have in view, which is the immediate realisation of a dividend to the shareholders, and which I consider is not only within our reach, but is absolutely in our power to enforce.

This broad assertion may appear somewhat strange, but when I tell you the mine is extensively developed, and that, comparatively speaking, very little ore has been taken away from the ground laid open between the 7th and 12th levels, even the most inexperienced in mining matters will readily understand that there is in this vast amount of developed ground a large amount of valuable ore, which only requires to be raised and sold to yield immediate dividends.

I am prepared to admit that in this almost unprecedented development in the annals of mining there has been an object in view, which will be patent to all when they are informed of the fact that Mr. Hamill, who has been the manager for some years past, holds 20,000 shares, or one-third of the capital stock of the company; but I maintain it is not fair that the shareholders representing the other two-thirds of the stock should be compelled to wait until it suits Mr. Hamill's pleasure to take away the ore in sight in the 7th, 8th, 9th, 10th, 11th, and 12th levels, to say nothing of the 13th level, which I believe is already driven a considerable distance in ore. Many of the shareholders, who are probably not conversant with the details of mining, can form no conception of the cost which has been incurred in developing a mine to this enormous extent, and when I say this has all been done by sales of ore extracted from the mine during its development, and not by calls upon the shareholders, it is clear that the present generation of shareholders have been developing the mine for the benefit of posterity.

Our manager, Mr. Hamill, receives 1000*l.* per annum for his services. The information supplied by him to the board has been at all times most meagre, as was stated at the last meeting by the directors, and I am informed particulars of the weight of the valuable sacks of ore which are from time to time sent from the mine (which only a few years ago used to be sold in Liverpool at 150*l.* per ton) have never been supplied to us.

You will, therefore, not be surprised that I deem it high time the shareholders should exert themselves to obtain some control in the management of this most thoroughly proved and valuable mine, with a view to the payment of dividends without further delay. We should also endeavour to prosecute more vigorously the work which is being carried on in but a desultory manner upon the 14 other lodes which are embraced in the company's property, some of which it appears have been lately producing fair quantities of rich ore, and which could most probably be made to pay a dividend of themselves, irrespective of the "Terrible" proper.

I, therefore, invite you to attend a meeting, to be held at the Exchange Buildings, George-yard, Lombard-street, on Oct. 2 next, at Two P.M., and in the event of your being unable to attend in person, I beg you will kindly sign the enclosed proxy, and return the same to me.

ARCHIBALD J. SMYTH.

16A, Tokenhouse-yard, E.C., Sept. 15.

THE "ASTOR" MINES, COLORADO.

SIR,—Could any reader of your esteemed Journal inform me through your medium if the rumour be correct that an English company is in course of formation to purchase and further develop the valuable group of mines known as the "Astor" in the Griffith mining district of Clear Creek County, State of Colorado? INVESTOR.

DYNAMIC FORCE—THE LAWS OF MOTION AS AFFECTING METALLIFEROUS VEINS AND PRODUCTS.

SIR,—That dynamic force affects metalliferous veins and deposits in various ways is a well known fact, first in the upheaval of the igneous rocks in whose vicinity the principal repositories of metallic ores are found. In what way igneous rocks conduce to the fecundity of the ore channels in the stratified rocks which have been displaced by their upheaval is not so well understood. As Mr. Phillips has remarked, family relations characterise the venous system of rocks; in other words they consist of series relatively associated, interdependent and contributory. It has been surmised that the origin of all metalliferous deposits is plutonic, and that the igneous rocks were the primary channels from whence they emanated, but that is a view too hypothetical for serious discussion, or even to found a specious theory upon. Again it has been surmised that true fissure veins descend into the earth to depths indefinite, and that they themselves were the channels through which the ores they contain ascended, which also is a conclusion unsupported by the facts. That a true fissure vein—or what is so called—is the result of dynamic action is not supported by any internal evidence in the vein itself. It is nationally inconceivable that a rent caused in the crust of the earth constituting the linear and indefinitely deep repositories of metalliferous minerals could have been by dynamic action, for if it had been the molten material from below, as in the case of dykes and mountain masses of the other igneous rocks would have been of a material and constituency consonant to them, and the evidence of their deep seated origin would have been as pronounced and unmistakable, whereas the evidence of intense heat except in few and very exceptional cases is remarkably conspicuous by its absence. If a fissure in the earth's crust was opened by dynamic force from below to what depth is it supposed the solid rock crust of the earth extends in a sufficiently indurated condition to admit of its fracture. If cast-iron melts at 2754° Fahr., and heat increases 1° in 45 ft. in descending into the earth, that substance would be found in a molten state at the depth of 23-4715 miles, a little less than 23½ miles under the surface, but above that and everywhere surrounding it a vast mass of plastic material of various descriptions prevails, occupying an intermediate position between the molten mass and the exterior rock shell which encircles the whole. The dynamic force of heat it cannot be supposed is inherent in the molten mass, but exterior to it, that is to say deeper still towards the centre of the globe and of gravitation. In what way can we imagine the application of external force to manifest itself in a comparatively pent-up mass but by an effort at effluvia, the effect of which, if any effect should be produced, would be expansion; expansion on what, a plastic mass of material, susceptible it might be of contraction, but if not of expansion, seeing that its already plastic condition so semi-lignidity has resulted from internal heat, an increase of that expanding force would render it more expanding still, so that rent, fracture, or compression of the molecules and mass of the encircling band, the rock shell, must inevitably result. But which is most probable, fracture or contraction, in such an order as to produce metalliferous fissure veins which shall not be filled up nor invaded by the molten material or by material akin thereto of the pent-up turbulent mass struggling for an outlet. Action and reaction expresses one of the postulates of dynamics. If there is an expanding force from within there is

also a conservative contracting force, that of gravitation, which acts with an increase of force proportioned to the square of the distance from its centre. But to produce a fracture corresponding to what is called a true metalliferous vein fissure from such agencies and conditions as I have here incidentally adverted to would be an impossibility in the nature of things so far as the human understanding takes cognizance of natural phenomena. Chemical agencies have much more to do with the formation and furnishing of metalliferous veins and deposits than the dynamic forces, although as things are conditioned the several sources and agencies of dynamic force and chemical action are apparently essential. The chemistry of Nature is stupendous, grandly magnificent in its silent working and intricate achievements. The force and effect of water insidiously percolating the rock framework of our world, performing functions as distinct and systematic as organised Nature performed them in the animal and vegetable economies, or as electricity operates in the same subterranean realms. Its power as a solvent and capacity as a vehicle the decomposition and conveyance of material in lignified form extracted from rocks of adamantine induration during its passage through them to deposit in fissures and caves itself subserves to elaborate and fructify, and with the aid of electricity constitute the ores of commerce.

The evidences in favour of the formation of metalliferous deposits by infiltration is everywhere abounding and overwhelming, whilst the theory of their purely igneous origin has no rational foundation in fact. The dynamic forces in this relation and their effects appear to be preconditions to the subsequent formation of metalliferous ores. The order prevailing in the venous system of the stratified rocks reposing on or abutting the igneous intrusions renders it highly probable that their formation and repletion with metallic minerals took place subsequent to such igneous upheavals. The whole appears to be necessary parts of a pre-designed and well-ordered system.

The displacement of older igneous rocks by more recent intrusions of whatever class such as has taken place in most of the mountain ranges of this state serve to show the destructive rather than the conservative tendency of such agencies to order. Rocks as huge and ponderous as the pyramids are broken and scattered like chaff before the wind with their precious contents of gold, silver, and other ores in abject confusion, but such phenomena merely adumbrates the events of Nature's working—the action and effect of dynamic forces—and not the origin or source of metalliferous lodes. Nature's working is one thing, and men's ideas of her operations—if indeed they have any consonant with the reality—may be quite another thing. To judge of their exploits in some of the mines here, one of which I am informed is operated by a London syndicate, seems almost sufficient to offend and disgust Nature itself. What a disparity there appears to be between practical skill, aided by scientific acquirements, and uncommon sense such as is displayed in such performances.—*Ellsworth, Nevada, Aug. 28.* ROBT. KNAPP.

MINERAL RESOURCES OF IRELAND.

SIR,—Your valuable and important advocacy of the development of the mineral resources of Ireland is beginning to draw attention to their past neglect, and the necessity for utilising the valuable mines and quarries hitherto either unworked or unexplored, which abound in many districts in Ireland, and which are almost unavailable for want of access by railway or otherwise. A further impediment to the development of this important element of our national wealth is the difficulty of reconciling the conflicting interests of owners, lessees, and occupiers of the locality in which mines and quarries are situated, and which impediment is increased by the value conferred on the tenants' interest by the Land Act, who now thinks he should require more for his tenant right than the owner should get for the fee.

To remedy this state of things several persons interested in mining have applied to me to draft a Bill for compulsory powers, and giving a cheap and ready mode of ascertaining compensation. This I have done, and submitted it to several members of Parliament who feel a deep interest in the subject, and who would have introduced it last session but for the reasons which excluded every measure of the kind. As such legislation is wanting both in England and Ireland, I think it important to attract public attention to the matter, especially as I believe the Bill will be introduced again in the next session. With proper safeguards for existing interests in demesne and other cultivated and preoccupied lands, with a power to make rail, tram, and other approaches within reasonable limits, with a cheap and facile mode of ascertaining the purchase-money or compensation by arbitration, and when parties do not agree by County Court decision, with an appeal to a judge and assessor at assizes, such as provided by the Bill referred to, great facilities would be given for the safe investment of capital in a direction hitherto almost unexplored.—*Dublin, Sept. 19.* GEORGE MALLEY.

THE MINERAL RESOURCES OF IRELAND.

SIR,—Having read with much interest the letter of Capt. Joseph Phillips in the Journal of Aug. 26 on the above subject, will you kindly allow me to add my experience thereto. I have just completed an extensive survey and inspection of the Lough Carrig Mine sett, near to Maam, in the county of Galway. This sett is a very extensive one, being about 1½ mile long and will average about 1 mile in width; it is bounded entirely on the west by the shores of Lough Carrig, a fresh water lake extending from Maam to Galway, a distance of 30 miles. The sett rises from the lake in an easterly direction, forming the side of a mountain until an altitude is attained on the eastern boundary of 114 fms., so that for mining purposes above 100 fms. of backs can be obtained above an adit level that may be driven eastward, commencing near to the shores of the lake. At the southern boundary of the sett and at the northern boundary, and again about midway between the former two, deep ravines are formed, running in a westerly direction down to the lake, and down each ravine a powerful stream of water is constantly flowing, the central stream alone having sufficient rise and power to drive ten 50-ft. diameter water-wheels 3 ft. breast, if at any time they should be required. A landing stage could readily be built of timber on the shore of the lake, from which inclined tramways could be laid, the full wagons down pulling the empty ones up to the works and dressing-floors. The lake being sufficiently deep for barges and light draught steamers to ply upon, this waterway to Galway is of great importance, reducing the cost of transit of minerals and materials to a nominal sum—in fact, all mineral raised on this property could be put into Swansea for 10*l.* per ton carriage.

From the foregoing it will be seen that no engine power or pumping machinery will be wanted here for very many years to come, if ever, the only question now being, is there any mineral here to be found? I at once say, and without fear of contradiction, that no such property so abundantly rich in silver-lead was ever seen in the West of England. I am aware, it has been said, that no real mineral lodes exist in Ireland; but this assertion like the Geological Survey of Ireland is fallacious. Mineral lodes do exist there, as I will herein prove, whilst the above Geological Survey represents this particular property as being composed of granite, whereas in reality it is composed of a fine free-working blue killas, exactly similar to that of the great lead-bearing districts of Cornwall. The middle stream before referred to has in the course of ages washed away the backs of one caunter and two east and west lodes, thus forming the ravine before mentioned; in this ravine these lodes, from 4 to 6 ft. wide, are distinctly visible, forming the bed of the stream across the sett, in addition to which 11 other lodes, about half of them north and south, may also be distinctly traced from this ravine and also in the southern half of the sett—at one point, particularly near the highest part of the sett, now named the Lead Quarry. These lodes form junctions one with another in the general form of an isosceles triangle, the points of which triangle would lay in a circle 400 fathoms diameter. From each of these lodes, varying in width from 3 to 6 ft., I broke along their course silver-lead of fine quality, not little bits just found here and there, but you may hammer away to your heart's content, making lead fly in all directions, and without any fear of destroying the looks of the property for those who may come afterwards to inspect; I have left more for them to hammer at than they will get through in the next 50 years.

The Lead Quarry lode as now standing shows silver-lead at surface worth 3½ to 4 tons to the fathom of ground. Four of the lodes in the ravine now show over 2 tons to the fathom, and there is not one that shows less than ½ ton, with one exception, and this lode seems to have been crushed or disturbed by the other powerful lodes in its vicinity. A shallow adit, 90 fms. in length, driven in from the ravine along the course of one of these lodes to a point beneath the Lead Quarry will give nine intersections of lodes, besides giving 30 fms. of backs at this point, whilst a deeper adit, driven on the course of another lode nearer to the shores of the lake, will give above a score of such intersections; these adits will give good profits in driving, being in richly mineralised ground. Here, then, is a property that will begin to yield profits to a company from the first day the miners commence working, for nothing has been done as yet, whilst the minerals so raised can be hauled and dressed entirely by water power, thus reducing the costs of working the mine to a minimum.

I have, however, frequently met with the foolish observation that it is not safe to put money into any Irish mining enterprise. To this I reply that the disturbance now in Ireland is over a land question, and which has nothing whatever to do with mining interests. Indeed, wherever I went and was known to be a mining engineer, I was received by the poor Irish labourers with the warmest welcome, they sincerely hoping that the mines would be started, and thus give labour to themselves and their families; as it is, they are half-starved and with no outlet for labour. The old adage is still true, that a certain personage of evil "finds some mischief still for idle hands to do." Give the Irish labourer work, and he will be more contented, and have less time to brood over his other grievances. Mining in Ireland is safe enough.

FREDERIC ASHWELL,

Truro, Cornwall, Sept. 19. Mining Engineer and Mineral Surveyor.

GOLD AMALGAMATION.

SIR,—Messrs. Crookes and Johnson and Matthey have not accepted my challenge, in the Times of Sept. 14th, to a competitive trial of our respective processes of gold amalgamation. Allow me, therefore, to say that, in 1868, Mr. Crookes published the following with respect to his sodium process—"The best proportion of amalgam to the mercury must be found out by experiment, as nearly every kind of ore will require a different treatment." Literally true to this day. A process, however, implies "an order of things"—an efficient adaptation of means to an end, and I am not aware of these gentlemen having elaborated any means to the end of gold amalgamation. The application of Mr. Crookes's process, on his own showing, involves long special training, and technical experiences.

On the other hand, after a good many years of experimental work in this one direction, I have hit upon an economical method of doing the desired work practically, without technical difficulty of any kind, requiring only unskilled labour and one uniform line of treatment for mixed ores, instead of the many different modes referred to by my friend Mr. Crookes. T. A. READWIN.

Bloomsbury-square, Sept. 20.

"A Practical Treatise on Metallurgy." By Wm. Crookes, F.R.S., and Ernst Rohrig, Ph.D., M.E. Vol. I., p. 350.

THE NEW AMALGAMATING MACHINE.

SIR,—When in Madrid last week I saw in the Journal of Sept. 2 the prospectus and sketch of a new amalgamator that is to excel everything of the kind previously constructed. I see mention that a gentleman has inspected all the patents on this subject for a certain number of years, and has found that the patent is good. Without wishing for one moment to question the truth of his report I think if he had gone as far back as the year 1862 or 1863 he might have come to a different conclusion. In either of the years 1865 or 1866 I saw at the Derbyshire Agricultural Show at Derby several machines, so far as my memory serves me, identical in principle and of the same form as this new amalgamator. Their use was to grind drugs. I had much conversation with the inventor and exhibitor (whose name I forget) and I was much pleased with the effective working of these machines.

Being engaged as the designer and erector of machinery for crushing quartz, and in making and working amalgamators for the extraction of gold therefrom, I feel it is of the utmost importance to me and others who are similarly engaged that there should be no doubt on this subject. If the principle and form are the same as in the one I have named this patent cannot be good even if the other has run out, for the same thing cannot be patented twice over. As this new amalgamator is a complicated, and if patentable (to coin a word) must be a very expensive article, it is of the utmost importance to the expected shareholders in the company as well as to all interested in the use of these things that there should be no doubt on the point I have named. I hope you will excuse me troubling you with this letter, but I cannot but believe that you will agree with me that the subject demands attention.

HENRY MOON, Mining Engineer, Leicester.

La Nava de Jadraque, Gaudalajara, Spain, Sept. 12.

MINING PROSPECTUSES—LORDS' DUES.

SIR,—Your correspondent "B. S." complains against the terms and conditions, and as he has perhaps more properly put it, impositions imposed by the lords of this country, and more especially those of Devon and Cornwall, on mining properties. I haste to echo his words, and I am sure it is an unmistakable fact that the lords themselves have been the cause of the great depression in the mining districts and the great depopulation of the country. I do not quote these words from mere rumour, or because I desire to make it more publicly known, but because the present lords (perhaps some of them may be just stepping into their father's shoes) are prone to impose more stringent terms than those of former terms. I have very lately been asked to join in an enterprise with some others of undoubted ability and capital, and all things being finally arranged with the understanding from the agent that a lease should be granted on what is called the usual terms, the dues alone being agreed to, it was subsequently, on perusal of these terms, found impossible to accede to them, and the mine is still idle, to the great detriment of the neighbourhood and surrounding towns, surely it may be asked when will our Cornish friends wake up and agitate, if necessary, for Parliamentary intervention? I cannot quite agree with him in regard to the cause of this abuse; I prefer to depict them not the uninitiated, but the initiated in most windles in these mining ventures, accompanied with the lords' overbearing covenants and extortionate charges, makes it next to an impossibility of success to the investing public.

In regard to those fashionable boards of directors, perhaps it may be taken as the rule, but not the exception. I am acquainted, and I may say connected with some that are men of ability and business tact, not to be surpassed by men of business in even private firms, but in general, perhaps, he is nearly right.

I am in a position to confirm his statement relative to the Lanzi estate, and to enlarge upon it in detail, having surveyed it twice purposely to test and to confirm or otherwise the reports made by practical mining engineers. The great silver-lead and blende lode, more than 100 ft. wide, has enough already in sight to yield, practically speaking, any supplies that may be required. There are four great copper lodes which will return immense quantities of rich copper ore, and the large deposits of hematite iron ore at surface will more than repay the entire capital required for the development of the whole of this property. The silver-lead and blende lode has a well-defined and direct course, and is proved to be a true lode, which strikes from east to west; it has been operated on at two places as quarries, where lead, blende, and calamine have been taken in immense quantities. On the west the quarry at present is upwards of 200 ft. high, the like on the east containing in its entirety lode stuff, or gangue, carrying silver-lead and blende ore. I will not take up your space with detailed descriptions of the various lodes this property contains, but content myself with the hope that your valuable Journal will ere long be the medium of more fully describing the mine, to the benefit of those who are and may be more intimately connected with it. I will only add that it may be hoped that the lords of this county will not provoke a contro-

versy with an investing public, but accede to fair and reasonable terms, such as can be obtained elsewhere, and that all promoters and others connected with mining properties will strictly adhere to terms according to precedent set forth in your correspondent's letter of the 16th inst. on the Lanzi Mine, and I recommend it to the perusal and consideration of all, and especially to those whose business it is to promote companies of the like description.

Exchange, Bristol, Sept. 20.

ESPERANZA.

SECURING SAFETY IN MINES

SIR,—I see the *Mining Journal* of Aug. 12, in the report of "Trade in South Wales," that the Royal Mines Commission have completed their experiments in the Rhondda Valley, but without reference to their general and lengthy experiments elsewhere. In their report they do not appear to be satisfied with any of the existing lamps, and this much is all that appears (at present) to have been given after so long and searching an investigation from so eminent a body of scientific gentlemen. Certainly a full and explicit report will be published at the final conclusion of their researches. (1). Mr. Inspector Wardell's remarks are worthy of note and praise (preferentially so), first, by explaining the mode of testing the lamps with good effects and safer working. The writer states that Mr. Wardell adds words of mighty import (thus)—"The safety-lamps where used must be always accompanied by constant and adequate ventilation. This ventilation is of just as much importance as in those where naked lights are used, and it is very desirable that the deputies should make the examination of such working places in as short a time as possible before the man or men go to work there." Sir, if the above report be true it is remarkable that the subject of ventilation should escape attention, showing that want of better ventilation is the primary cause of the deplorable accidents that are still from week to week brought to light.

Rotherhithe, Sept. 19.

JOHN ONIONS.

TREATING UNDRESSED LEAD ORES.

SIR,—In the *Journal* of last Saturday Mr. Henry Maudsley asks the question if lead ores undressed cannot be directly treated by smelting. As one interested in smelting operations, and having greater faith in furnace capabilities than a good many people, I should like to say that before this question could be answered we should—1. Have to know what the percentage of ore to be treated is, and the matrix with which it is associated.—2. What would be the price of stamping and washing the ore up to (say) 75 per cent., and the loss in doing so.—3. Whether fuel and labour could be had cheaply. With these particulars before us we might be better able to discuss the matter.—London, Sept. 20.

REGULUS.

RICH PARCELS OF TINSTONE.

SIR,—I read in your valuable *Journal* that Capt. Tregay had sold from Mount Carbis the richest parcel of tinstone that had been sold in the neighbourhood for years at 141. per ton. Allow me to say that we sold at Pendarves United Mine in 1880 and 1881 parcels of tinstone above 200. per ton—one parcel at 251. per ton. I was glad to read that Mount Carbis is looking so well, but I thought it my duty to correct this error.

JOHN BRENTON.

Salonica Mining Company, Peikora, Aug. 30.

THE APPROACHING RISE IN LEAD, AND THE GOGINAN SILVER-LEAD MINE.

SIR,—From an article upon the Lead Trade which appeared in the *Times* of Aug. 19 it seems quite clear and free from doubt that we are on the eve of a very considerable rise in the value of the metal, brought about not merely by a somewhat tardy improvement in trade, but also by a new and special demand for the article in connection with the vast strides being made in electric illumination, which must at an early day supersede the ancient, but withal useful, gas. It appears from the exhaustive experiments of our first electricians that, for the purpose of storing electric power, lead is at once the best and by far the cheapest medium yet discovered, and we have the authority of the *Times* for the statement that the demand for this purpose amounts already to 400 tons of pig-lead per month. An important demand like this (almost certain to steadily increase with the extension of electric lighting) coming at a time when production is rapidly falling off, both in this country and on the Continent, owing to the fact that for some years past mineowners have been using up their reserves without developing fresh discoveries, must naturally tend to greatly enhance the market price of the metal.

Under these circumstances one is naturally led to look around and see where lead mines are to be found that contain in themselves the elements of success, and give evidence of being able to benefit fully by the favourable conditions under which they are situated. Having read several letters touching upon the Welsh lead mines in recent issues of your valuable paper, I have been led to look rather closely into the prospects of such undertakings as likely to be affected by a recovery in the lead trade, and, like your correspondent "Mining Tourist," I, too, have at various times spent many a pleasant holiday in Wales, and have visited most, if not all, of the best mines in the Principality. After careful consideration, I think I may confidently say that in no case have I ever come across any property possessing in a greater degree all the elements of success, or one more favourably situated for the production of large quantities of silver-lead ore of very high grade, than the celebrated old Goginan Mine, near Aberystwyth, which has been successfully worked ever since my early boyhood, the management, until lately, having been in the hands of the well-known firm of Messrs. John Taylor and Sons, of London.

The past history of this wonderful property reads more like a chapter from the Arabian Nights Entertainment than the sober history of a Welsh mine. It is recorded, and the facts can be verified in the most ample manner, that in the year 1838 a sum of only 500*l.* was subscribed with a view to opening out and developing this property, and so great was the success that in a very few years profits amounting to nearly 50,000*l.* had been made. It is further recorded that in the year 1849, in the midst of a period of great commercial depression, dividends of no less than 700 per cent. were paid to the fortunate proprietors. For many years the monthly sales of silver-lead were from 200 to 250 tons per month, and I believe that from first to last a total profit approaching to 100,000*l.* was returned to the shareholders upon their original outlay. Although I was but a mere lad at the time Goginan commenced to make its great returns, I remember well the enthusiasm that existed, and how in the district the name of John Taylor and Sons has ever since been a household word. I can also recall the fact that upon the lovely and romantic spot in which the works are situated—possibly one of the finest bits of hill country in all Cardiganshire—quite a town rapidly sprang up, called to this day Goginan, in which the miners lived and some of them still live, and whose hardy sons are known as amongst the best miners in all parts of the globe to which British enterprise has penetrated. It was here that the well-known Capt. Matthew Francis resided, than whom few have done more to popularise and develop Welsh mining industry.

I dare say many of your readers remember that this famous mine passed into the hands of a new company about 18 months ago, who being well provided with the sinews of war (and of mining) have since been actively at work clearing up the old workings, erecting new machinery of the most approved type, sinking the shafts, extending the levels, and exploring new ground in a most vigorous manner. The result is they have laid open continuations of the old rich bodies of silver-lead ore, and have discovered new deposits, and are accumulating good reserves. The ore, be it observed, is of the same sterling quality produced by the mine in its most prosperous days, and contains from 30 to 35 ozs. of silver to the ton.

The rock-drills and improved machinery place the present company in a greatly improved position, inasmuch as they cannot only drive the levels and sink the shafts about four times as fast, but they can dress the ore much cleaner, and save all the silver, which was impossible with the old appliances. Knowing this company to be

well supplied with capital, and taking into account its almost unparalleled advantages as regards water-power, and other facilities for cheap working, the price at which the shares are quoted—about par—is unquestionably very tempting. My unbiased opinion is that this is undoubtedly one of the mines in which shares should be secured, so as to benefit by the inevitable improvement in the lead trade. I hope I have not intruded too much on your valuable space.

Abbey Foregate, Shrewsbury, Sept. 18.

INVESTIGATOR.

EAST WHEAL ROSE—VALUABLE DISCOVERY.

SIR,—Being in Cornwall last week, in the neighbourhood of Truro, and hearing of a great discovery of silver-lead ore at the East Wheal Rose Mine, I took the liberty of calling at the mine. I met the agent, Capt. Doidge, whom I have known for many years, and, knowing him to be a trustworthy honest man, I enquired of him about the great discovery of lead; he told me it was from Innes's lode—quite a new feature in the mine. He then took me to the shaft, and showed me the lead work that had been drawn up from the lode, which was very rich work; he also took me to the office, and there showed me rocks of lead all but solid, some of which were 2 cwt.; prettier ore, better specimens from a lode 10 fms. under the adit level, I never saw. Capt. Doidge asked me what was my opinion of the value of such a lode? I told him from 3 to 4 tons of lead to the fathom—that was if the lode was as good as the specimens. He told me it was the same all up and down the forebreast of the end. I quite agree with the agents for keeping down the value a little in case of a falling off in some parts, which is always the case. But I do not believe that there is much fear of this lode falling off in value. What speaks more for this discovery is being in the south part of the mine, and going into virgin ground, and, according to my opinion, this part of the mine will prove quite equal in richness as the north mine, which all mining men know, was a very rich mine. I was also shown the new 90-in. engine, and it was working admirably well, and Capt. Doidge told me the water was then forked to the 30. In conclusion, I beg to say I am quite sure that East Wheal Rose will in a very short time resume its old position on the Dividend List, and well pay the proprietors for their energy and outlay.—Sept. 21.

WM. BENNETTS.

VALUABLE DISCOVERY—"EAST OF TRURO BRIDGE."

SIR,—There are but few persons we imagine interested in our metallic mining industry who are unfamiliar with the old Cornish proverb prevalent nearly a century ago that it was "Useless to search for copper east of Truro Bridge." It is impossible to estimate the influence such a belief exerted in retarding the development of an industry which has since added incalculable wealth to the nation, and in the present day occupies a leading position amongst the similar industries of the world, and is equally impossible under the distance of time to fully understand the state of knowledge then surrounding it, which led to ideas and theories since proved so erroneous. It is more to the purpose to consider the rapid advance made in the knowledge of the laws surrounding the formation of mineral deposits and the benefits realised, inasmuch as it is not too much to say that the uncertainty which in the time of our forefathers was inseparably associated with the introduction of a new speculation, owing to ignorance of the features which should determine its selection, is in our day reduced to a minimum, which is scarcely more problematical than that involved in other commercial undertakings. The studies of Sir Henry de la Beche removed a vast deal of ignorance, and opened up on sound theories a splendid field for practical research and observation, and when one of the chief results had been to show that Truro Bridge possessed no geological features of limitation, and that the place where mineral treasures might with confidence be sought for was the junction of the secondary formation with the granite intrusions, the tide of speculation rapidly moved eastward, resulting in discoveries of riches of untold extent. We are led to these observations from the discoveries made at East Devon Consols, and the confirmation they afford of the established theory referred to. East Devon Consols is situated on the eastern limit of the granite system of Cornwall and Devon, where it terminates, and is seen no more in England. The features surrounding the discoveries in East Devon are proved to be thoroughly conformable to the recognised geological conditions of success, and its projectors and shareholders are to be equally congratulated—the former for the substantiation of the wisdom of their choice, and the latter for the benefit of participating in it.

CORNUBIENSIS.

MINING IN THE VOR DISTRICT.

SIR,—In the adit level at New Great Wheal Vor the lode is 5 feet wide, containing good tinstone throughout, so that it will be all submitted to metallurgical treatment. To find a lode of such a quality so near the surface (20 fathoms) is a very rare occurrence. The agent told me that any miner would so pronounce it. The engine purchased for this mine will be brought on the ground in a few days, the house being ordered for its reception. The engine will both pump and stamp.

At North Metal the water is drained to the 20 fathom level, and pumps are ready for dropping to the bottom (30 fathom) level, where the miners say tin will be found. From the bottom a crosscut will be driven southward to intersect the Great Wheal Vor lode, which at the west was so very rich as to give a profit of about 300,000*l.* I saw some very rich tin stones brought up to-day from the 20 level: 24 heads of stamps will be ready in a few weeks for reducing the tinstone, and the dressing-floors will be prepared with all expedition; so that we may look out for the sale of tin ore to the smelters at no distant date. At Great East Vor, situated immediately east of North Metal, the prospects are also very satisfactory.—Truro, Sept. 20.

R. SYMONS.

MINING LEASES.

SIR,—I think that it is time for legislative interference in the matter of conveyancing—the legal charges for conveyances, mining leases, &c., being excessive in a high degree. In the olden times—say, 60 years ago only—the solicitor's charge for a lease of mining ground for 21 years was about 20*l.*, when the stamp duty was little less than 7*l.* on lease and counterpart. At present, with the stamp duty a mere trifle, they charge for a mining lease from 25 to 40 guineas—generally 30 guineas. Only a few weeks ago I know that a solicitor charged 30 guineas for a lease, and 5 guineas besides for attendances at his office with reference to the lease. He also charged 100*l.* for five years' rent in advance, and 200*l.* for a field in which the works are to be carried on, which field was paid for also by the previous workers. Notwithstanding all these payments the lessee is not at liberty to extend his operations beyond the present waste without the consent of the landowner previously obtained, and although the field has been paid for by the lessee, when he ceases to work he must surrender it to the lord, and everything erected thereon, however valuable the erections may be. The absurdity—if not iniquity—of such conditions as those enforced on lessees of mines is too obvious to all thinking honest men to be justified by anyone of them. Selfishness is too clearly seen in all the conditions referred to, and in other covenants in the lease not referred to.

I understand that some years ago some legal functionary undertook to bring before Parliament a Bill for the simplification of transfers of property of all kinds. Such a Bill should be enacted as would prevent the heavy charges now made for every kind of legal instrument. I hear that Clifford Amalgamated (United and Consolidated Mines in Gwennap) is to be re-opened by a company formed by the promoters of East Wheal Rose, Shepherds Mine, &c. The landowners of Cosgarne Common, where these mines are situated, are at least eight in number—Lord Clifford, Lord Clinton, Rev. St. Aubyn, Mrs. Lawrence, Sir W. Williams, Mr. R. Harvey's representatives, Mr. Beauchamp, and Rev. J. Ford. If for each lease 30 guineas is to be charged the whole leases will cost 240 guineas! This is a heavy item on a mining speculation. It should be arranged that one lease should embrace all the lords, but the legal gentry are not likely to assent to a reduction of their fees. Nothing less than Parliamentary compulsion will alter the present vile state of things.

There is an inconvenience attached to the plurality of landowners who hold undivided interests in the manor of Cosgarne. Each

lord has his toller, or mineral agent. If I apply to one and get his consent to grant to three nominated lessees, when I go to another agent, or to the lord's solicitor, he may object to one or more of the persons named. When I have satisfied him by introducing other names, another agent may say, "I don't approve of Mr. or Captain So-and-so as lessee," and by such objections the applicant for the grant is "driven," as people say, "from pillar to post," causing much loss of time and money, and vexation. To avoid which the landowners should vest in one solicitor or mineral agent the power to represent them all, and to grant to lessees of his approval as though all the undivided interests were one.

Mr. Marrack, Mr. F. H. Cook, or Mr. Hill would be a good representative to act in that capacity as regards Cosgarne. Such an appointment would facilitate the working of mines so circumstanced by the saving of time now wasted in running after agents of diversified views.—London, Sept. 21.

AN ADVENTURER.

THE SILVER HILL MINE AND DISTRICT.

SIR,—Though agreeing in the main with your correspondent "B" ancient Silver Hill and the neighbouring mines, I trust you will allow me to demur to one or two of his statements. He says there are three properties working in this district. I venture to suggest that the southern portion of the Prince of Wales Mine is in the district. The district referred to should be clearly defined. In my opinion it extends from Gunnislake, on the east, to Callington, on the west, embracing the foot of the southern slope of Kit Hill. Here, and here only in the British Isles, is a true silver-bearing zone, containing two main lodes, which are sometimes split into three or four. This belt extends for a distance of some three miles east and west, with a breadth of about 200 yards, and in this comparatively small space exists, I believe, a mass of mineral wealth, equal in quantity to that found in any similar place in any part of the world. The tin lodes and copper lodes may add to the value of the properties; but the real points of interest are the silver lodes. Ignorance and laziness will spoil any enterprise. I cannot accuse the Silver Hill management of laziness; but I fear they are even now throwing away lodestuff that properly treated will pay the costs of the mine, and I publicly, for the public good, enquire what do the directors of Silver Hill know of the treatment of low grade silver ore? What have they done with the silver ore, that has yielded from 6 to 40 ozs. to the ton? If they have not done anything with it do they mean to?

It is currently reported the ignorance of the proprietors of another mine in this immediate neighbourhood caused the parish road to be meted with slag worth 70*l.* and upwards per ton for silver. Will such a mistake be repeated at Silver Hill? If not, why is it no silver has yet been extracted from the lodestuff?

To return to "B." He says "the valuable portion of Wheal Brothers lode is above the tunnel near the gossan." It is quite true that the riches found in Wheal Brothers Mine, and which considerably exceeded "B's" figures, were found between the surface and the 40 below adit, for the simple reason that the mine is but 40 fms. deep. In my opinion, however, and that opinion is shared by eminent geologists who have made the district their study, the wealth obtained from Wheal Brothers lode above the 40 is but an indication of the much greater wealth to be found below. "B" says nothing of the value of Wheal Langford. When last worked, that mine yielded, I believe, over 90,000*l.* in two years.

Lastly, I would observe Wheal Brothers Mine is not half a mile from Silver Hill, where, as "B" observes, there is the same lode in the same channel of ground, and where, I will add, I believe, even now a valuable course of silver has been opened on, and is being thrown away because the directors and their manager do not understand the treatment of silver ores.

MINER.

[For remainder of Original Correspondence see Journal.]

FOREIGN MINING AND METALLURGY.

There is scarcely any change to report in the general tone of the Belgian coal trade. Transactions have been numerous, and orders have continued to come to hand freely, enabling producers to dispose of their extraction with ease. No advance has, however, taken place in industrial qualities of coal, the condition of the iron trade not being sufficiently brilliant to induce forgemasters to accept higher terms without offering all possible resistance to them. Upon the whole, it may be said that while the requirements of consumers are considerable quotations are stationary, although they have exhibited much firmness. There has been a fair enquiry for coal upon the Belgian markets on French account. Coke has been scarce in Belgium. An upward movement continues to be remarked in the German coal trade, and transactions have been very numerous as well on home as on foreign account. Deliveries *via* the Rhine have regained a certain importance, while the exports from Westphalia to France, as well as from Upper Silesia to Austria and Hungary, are above the average. German coal is said to be competing advantageously with English coal in the ports of the North Sea.

Firmness has continued to be the prevailing characteristic of the Belgian iron trade, although prices cannot be said to have experienced any change of importance. Employment has been fairly abundant, and orders have not ceased to come to hand. At the same time, the recent troubles in Egypt have caused some clients to show indecision, as it has been felt that political complications may arise out of the course which affairs have taken this year in the East. Business which is deferred cannot be regarded, however, as wholly lost, and Belgian firms are generally sufficiently provided with orders to be enabled to wait. So much is this the case that an Austrian company which desired to procure immediately 1000 trucks was not able to arrive at an understanding with the proprietors of Belgian construction workshops, in consequence of the period allowed for delivery being too short. Pig has been generally well maintained in Belgium. English casting pig has brought about 2*l.* 12s. per ton, while Belgian casting pig has been in demand at 3*l.* per ton. Refining pig has ranged from 2*l.* 8s. to 2*l.* 16s. per ton, according to numbers, but no great amount of business has been passing in it. Athus has maintained its rate for pig with firmness at 2*l.* 6s. per ton; a number of contracts will be renewed next month, and it is probable that this price will serve as a basis for future transactions. Iron has been generally maintained with firmness upon the Belgian markets. No. 1 has brought 5*l.* 8s. per ton, and No. 2 5*l.* 16s. per ton; some works which are well provided with orders may, perhaps, ask for higher rates, but this is not generally the case. Girders have been in request at 5*l.* 16s. to 6*l.* per ton. Plates have been firm. The general quotation for No. 2 has been 7*l.* 12s. per ton. Contracts have just been let for the delivery of 85 locomotive tenders: seven lots of 10 tenders each were taken at 2020*l.* per lot, or 202*l.* per tender. Another lot of 14 tenders was taken at 2848*l.*, or about 203*l.* per tender.

The French ironworks still continue well employed; nevertheless prices appear to be rather tending downwards than upwards at Paris. The forgemasters of the Nord have shown no inclination to accept lower rates, but upon the Paris market merchants have been doing business in bars at 7*l.* 18s. per ton. Quotations for pig show a considerable firmness. In the Longwy group two-thirds of the probable production for a lengthened period has been disposed of; under these circumstances firmness naturally prevails. At a recent adjudication of 3000 tons of wire tenders were not received for several lots, and fresh invitations for tenders have accordingly been addressed to some of the principal producing firms. In Germany the iron trade has continued to present a good tone. Fresh orders have come to hand almost daily, and new contracts have been concluded for considerable quantities of iron. The demand for pig has not slackened, and iron has also continued in active demand. The exports of iron wire to Italy, Spain, and Russia are increasing in importance, while Belgium and France are also laying in supplies at the German works. The steelworks are well provided with orders, and the same may be said of the mechanical construction establishments. During the last few days orders have been placed in Germany for 44 locomotives—12 engines for the Alsace and Lorraine

lines, 20 engines for the State lines, and 12 engines for the Hanoverian lines. The value of the 44 engines, according to the lowest tenders submitted, was 78,424.

REPORT FROM CORNWALL.

Sept. 21.—Our forecast of the improvement in the tin market, and as a result in the value of mining property generally, is being realised somewhat more rapidly even than we anticipated, and we expect a still further advance before the upward tendency is checked. Still, even at present prices a good deal more may be done with some of our mines than they have been doing, if they were managed more in accordance with modern ideas and less after the fashion of the past. In this particular we shall not be surprised, however, to see very great changes take place, for certainly the disposition to accept the conditions of progress is greater than it has been at any previous period in our history.

The Polytechnic Jubilee has in every way proved what our friends across the water would call "a big success." The average receipts of the ordinary five days' exhibition have been somewhat under 1000; but this year, while the time has been doubled, the receipts have more than trebled, reaching a total of 3217. This does not represent by any means a corresponding amount of profit, for the expenses have been very heavy, but it does of work done, which is after all the main object in view. The excursion to the Carn Brea mining district on Thursday last was one of the most pleasant and enjoyable of the whole series. Carn Brea, East Pool, and Dolcoath were the mines visited, and the day's proceedings wound up with a luncheon at Dolcoath. The outward drive from Falmouth was by Ponsanouth, the return by Tehidy, Portreath, and Redruth.

The details of the drill trials in the granite at the Polytechnic were given last week. Those in the greenstone showed far more divergence in the results, as might indeed have been anticipated from the toughness of the rock. The results were:—The Stephens did 10 in. in 10 minutes, mean pressure 60. The Excelsior did 13 in. in 10 minutes 7 seconds, average pressure 60. There were three long stoppages, and the rock split. The Eclipse did 16 in. in 10 minutes, average pressure 60. The Cornish did 13 in. in 5 minutes 20 seconds, mean pressure 60. The first borer broke after 40 seconds' work. A final measurement of the holes was taken on Friday by Messrs. E. D. Anderson, R. Sharpe, and E. Kitto. And on Monday the judges on the result of the double set of trials awarded the Cornish drill of Messrs. McCulloch and Holman a first silver medal, and the Stephens drill a first bronze. Messrs. Hathorn and Co., whose Eclipse was medalled in previous years, were heartily thanked for the use of their Reliance air-compressor, by which the drills were worked.

Efforts are being made to arrange for the Exhibition of the Mining Institute at Redruth.

REPORT FROM DERBYSHIRE AND YORKSHIRE.

Sept. 21.—There has been little or no change in the state of the iron trade during the week, the men as a rule being well employed. Among the coal miners, however, there has been some show of taking notice of the proposal to strike at all the collieries unless the owners consent to give an advance of wages on or before Oct. 1. But the Derbyshire miners are not likely to take any part in a strike if such should take place, the probability of which appears to get more remote every day. However, a meeting has been called to take place at Chesterfield on Saturday, for the purpose of taking into consideration the present condition of trade and the movement set on foot for a general strike. In the northern portion of the county the men who belong to an association have already determined that the time is inopportune for resorting to a strike for the purpose of raising wages, and this is likely to be the opinion of the men throughout the county. During the summer months the miners had a very hard time of it; but latterly a great many of them have been fully employed, and this advantage they are not likely to give up at the instance of men who have nothing to lose by making a striking experiment on a large scale, seeing that they have good salaries to go on with, and paid by those who they now ask to carry out an idea which they think will place them in a prominent position amongst the leading agitators. But, as previously stated, there is now a fair demand for house coal, and as this is likely to go on there is every appearance that the miners will be well employed up to the end of the year, and that they will heartily avail themselves of the opportunity of working full time. There has been a slight increase in the price of coal at several places, but not to the extent of increasing wages, but even that in all probability will follow before long. Steam coal is scarcely in such good request as it has been, although there has been no falling off as regards the quantity consumed at the local furnaces, but the locomotive requirements generally fall off about this period of the year. Engine coal, too, does not go off quite so freely as it has done, whilst the make of coke is so small in comparison with the consumption that a considerable tonnage has to be reported. This is certainly somewhat singular, seeing that the Derbyshire coal is well adapted for making excellent coke, from which there is a fair profit derived, which is more than can be said with respect to the raw material. At the ironworks business goes on much as usual, a steady business being done in pig, whilst rolled iron is still in but moderate request.

In Sheffield the works are well employed all round, more especially in the heavy departments. A good deal of pig-iron continues to be imported, there being just now a rather good run on hematites for both crucible and Bessemer steel. The Atlas and Cyclops Works have been working well on armour-plates, there being a rather heavy demand for them, with every prospect of its continuing to increase more than otherwise. For these plates there is a large consumption of steel as well as iron, for they are now being made much thicker than they were in the first instance, so that they have stood the most severe tests without material injury. Ordinary plates for ship and boiler makers have also been extensively produced. Steel rails are not in such request as they have been, or rather our makers have not been able to make offers so low as those in the North of England, whose works are close to a seaport. It is, however, expected that early next year Messrs. Cammell and Co. will have their rail works in Cumberland fully going, and to which the plant from Dronfield will be removed. A good deal of steel has been absorbed in the making of wheels, axles, tyres, and similar material, for which some considerable orders are in hand; and, in fact, there has been a decided improvement of late as regards crucible steel. Table and light cutlery goods have gone off tolerably well, and reports from the home markets are more favourable now than harvesting operations are coming to a close. There is also a steady business doing with America and some parts of the Continent as well. Australia and other of our colonies have been sending some good lines, not only for cutlery, but for other material as well.

The coal trade of South Yorkshire is in a tolerably healthy state, but during the week several meetings have been held for the purpose of forwarding the general strike movement, which promises to result in a most signal failure. Several meetings have been held, but there appears to be a strong feeling in favour of limiting production instead of having a general strike. But Mr. Pickard, the chief of the Miners' Association at Barnsley goes in boldly for a strike all round. But as his views have not been accepted by Northumberland, Durham, South Wales, and other of our largest mining districts, they are not likely to be carried out. There may, indeed, be some few hundred coal miners who will brave everything and throw down their tools, but they will not receive much support, from those who are desirous and willing to work for such wages as they know the state of the trade will admit of. However, a meeting is to be held on Monday next at Rotherham, when the question is to be fully discussed, and parties, Unionists and non-Unionists, are invited to be present. The circular calling the meeting, has emanated from the officials of the West Riding Miners' Association, of which Mr. Pickard is one of the chiefs, and it is evident that he has some doubts as to the policy he has initiated being carried out even on a limited scale within his own district. The men, and their leaders as well, know that the present price of coal will not admit of wages being advanced, but they think that

by limiting the supplies prices would go up. In this they are right, for such would naturally be the case, but only for a short time, and during that a great number of the miners would be in a state of comparative starvation, as has been forcibly put by one of the oldest miners in the West Riding, and who has been a leading agitator, for he says that all the associations of miners put together could not pay their members 10s. each for one week only. Under such circumstances it need scarcely be said that a strike is simply impossible, and although some men may be stupid enough to go out, they will be glad enough to resume work when they find that there is no fund to support them.

REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

Sept. 21.—The somewhat greater strength noted in the price of coal last week is still observable. The firmness, however, relates to forward contracts rather than to prompt supplies. In respect of these latter Staffordshire forge coal may still be had at 6s. to 7s. and 7s. 6d. at the pits, according to quality, and furnace coal at 7s. 6d., 8s., and 9s. 6d., according to quality. The last named price is, however, got but rarely. Ironstone sells rather better, brown calcined sorts being 11s. per ton delivered. Foreign pig-iron maintains last week's advance of 2s. 6d. per ton, and the Thorncliffe pigs are now quoted at 2s. 6d., making them 62s. 6d. delivered. Native cinder pigs are 37s. 6d. to 40s. Manufactured iron is in improved sale, and is strong at 67. 5s. to 67. 10s. for common bars, 97. to 97. 5s. for sheets (doubles), &c.

The wages agitation among the colliers continues to gather force and become more organised. A conference of the Board of the Federation of Miners for the Midland Counties was held at Wolverhampton, on Tuesday. Delegates were present representing North and South Staffordshire, East Worcestershire, and Salop, and the following resolution was carried:—"That this board agrees with the application about to be made in North Staffordshire for an advance of 10 per cent. wages. We hereby instruct each district of this Federation to at once make application for a similar advance; and we further recommend that joint meetings of employers and workmen be held in every district on the wages question previous to giving notice." The board also instructed their secretary to apply to the secretary of the South Staffordshire coal trade asking him to call an early meeting of the employers to consider the wages question. The Cannock Chase district was not represented at the Conference, but a deputation was appointed to obtain their views on the matter.

The direct action which has up to the present been taken by the North Staffordshire miners has been confined exclusively to the northern part of the district, where a ballot has shown that over 5000 miners are in favour of giving notice for a 10 per cent. advance. But it is expected that the example of these men will soon be followed by colliers in other parts of Staffordshire. There are and have been for several years considerable irregularities in the rates of wages paid in North Staffordshire, and no attempt seems to have been made to effect agreement.

The annual engineers' reports which are to be laid before the South Staffordshire Mines Drainage Commissioners at their annual meeting on the 4th proximo, contain important information. The mines drainage report of Mr. Edward Terry states that in the original Tipton district the progress made in pumping has been satisfactory. In the Bilston portion of the district, owing in a great measure to the excessive rainfall, no progress has been made, and the water now stands at a higher level than 12 months ago.

The cost of pumping the Tipton and Bilston districts for the year ending June 30 last was 18,1087. The total cost for the present year is estimated at 17,7017. This sum exceeds the estimated revenue by 37007. Mr. Terry is satisfied that the only way to reduce the expenditure is to make as rapidly as possible the capital outlay recommended by him a year ago. This outlay totals 19,0007.

Elijah Davis, manager of the South Staffordshire Colliery, West Bromwich, was summoned by the Government Mines Inspector for neglecting to provide sufficient ventilation. On May 1 six colliers were badly burned by an explosion in the pit, which occurred as soon as they had descended to the bottom of the shaft. A hearing has been driven to connect the two pits, and there was insufficient ventilation. The gas fired at the "doggie's" naked light. The Inspector regretted that he could not prosecute this man. Defendant was fined 57. and costs.

TRADE IN SOUTH WALES.

Sept. 21.—The demand for steam coal is still as active as ever, while household qualities are being enquired for in consequence of the rapid approach of cold weather, which bids fair to set in early this year. Cardiff sent away last week 116,499 tons foreign, and 21,620 coastwise; Newport, 27,792 tons foreign, and 19,605 coastwise; Swansea, 19,423 tons foreign, and 8909 coastwise. There is a good trade also in patent fuel, of which 2294 tons were sent away from Cardiff, and Swansea 6734 tons. The resolution passed at the Manchester Conference, to strike for a 10 per cent. advance, will not take effect here, as the men are working under a sliding scale, which has just been signed by the joint committee. The output of this district is constantly increasing, but wages remain low compared with the prices which ruled in 1873-4.

The strike at the Landore Steelworks is at an end so far as the old works are concerned, the men having returned on the company's terms. At the new works the gas at 14 furnaces was lighted on Tuesday, and a notice posted up notifying that the hammermen can return at the reduction, which will no doubt be the case in a few days. The resolution of the steel rail makers to form an association, in order to prevent the undue lowering of prices, will have a good effect upon trade here. Sir Henry Tyler, M.P., of the Rhymney Company, and Mr. Whitworth, M.P., of the Tredegar Company, have been chosen to act on the committee, so that this district is powerfully represented. Cardiff sent away last week 2294 tons of rails, and there is a large quantity now ready for shipment at Newport for South America and the Cape. Tin-plates are in fair demand, at 16s. 6d. to 17s. per box for coke made, and 19s. to 20s. for charcoal made. There is no complaint of want of orders at those works which are now open.

The various dock projects in the Bristol Channel are numerous, and if they are all carried out will create an amount of activity in this district which will have no precedent. At Newport a new dock will be built to the west of the town, towards Cardiff, while Lord Bute will build another in the direction of Newport. There is thus a sharp rivalry between Sir George Elliot, M.P., and Lord Bute, and as both are rich men neither of them will pause for want of funds. At Penarth there is a dock now being built by Mr. Walker, the contractor, while at Barry Island, a few miles lower down the channel, another new dock is contemplated, which will cost, with railway, from 750,0007. to 1,000,0007. At Neath still another new dock is being built, while Swansea has just completed the Prince of Wales Dock, where the electric light is now in full work, and every night during the time that vessels can enter and leave the dock it throws a brilliant and steady light over the entrance locks and basin. The lamps are five in number, of the Brush system, equal to 2000-candle power each, and are placed about 100 yards apart. The light is produced by a No. 5 Anglo-American dynamo machine, fixed about 400 yards from the lamps, the connecting wires being carried underground. The lamps, connections, and dynamo machine were erected by the Swansea Harbour Trust. The machine is driven at a speed of 900 revolutions per minute by a counter shaft and a very neat 8-horse power horizontal engine, made specially for high speed, and erected and started to work for the Swansea Harbour Trustees by Dyne, Steel, and Son, engineers, Swansea. It is fitted with a very simple and highly sensitive high-speed equilibrium governor, regularity of the engine speed being, as we are informed, of the greatest importance in producing a steady light. The speed of the dynamo machine is indicated by a tachometer, an ingenious piece of mechanism, which shows to a single revolution the speed at which the machine is running, and from which it is driven by a small belt. The engine runs easily at 150 revolutions per minute, with a steam pressure of 60 lbs. per square inch, the tachometer showing a steady speed

of 900 revolutions per minute on the dynamo machine. It is intended to place an additional lamp at the end of the new east pier, about a quarter of a mile from the engine-house.

The Ocean Colliery Company employ the largest number of men in the Rhondda and Ogmore Valleys; in both districts they number not less than four or five thousand men. Anxious to promote as much as possible the moral and mental welfare of these persons, and of presenting counter attractions to the public-house, the firm, of which Mr. D. Davies, M.P. for Cardigan, and Mr. Riches, Cardiff, are leading members, and Mr. William Jenkins, Ystradfechan House, is general manager, resolved some while ago to establish a coffee tavern at one of their populous centres—Cwmpark. This place is situated just opposite Treorky, across the Rhondda river and near Ystradfechan, and comprises several thousand inhabitants. It is as yet merely in an incipient stage of development, for besides the Cwmpark Colliery now in operation another pit has been partly sunk above the village. The Cwmpark Coffee Tavern once practically broached was not difficult to arrange for. The company, with that liberality which has so highly commended itself to their employees, and which is its own best commendation, made a voluntary and unasked for presentation for the purpose of a building which they had in days gone by purchased for the Calvinistic Methodists and utilised as day-school premises until the removal of the scholars to more substantial quarters. This was a gift to the public which was approximately valued at 4507. The coffee tavern proved a fair success, and this encouraged the Ocean Company to further philanthropy. They resolved upon adding a wing to the coffee tavern, and establishing a free library. Mr. David Morgan, Treorky, was the builder, and the work was recently finished at a cost of 4007. Another 1007. was given by the company to assist in purchasing books for the library. The total presentations of the company fell not much short in value of 10007.

REPORT FROM NORTH WALES, SALOP, AND CARDIGAN.

Sept. 21.—The owners of the United Glyn and Van Consols earn the distinction coveted by Mark Tapley—that of being "jolly under creditable circumstances." Their reports are discouraging, but they keep their heads up like brave men, as they are, and I wish them better times. We are probably on the eve of another strike among the colliers in North Wales—this time probably of larger dimensions than before, and the men, at the bidding of those who lead them by the nose, are playing a high game. The are going in—or out—for 15 per cent. advance. I do not know how the colliery owners are to give it. I think that among all the collieries of North Wales you could count upon the finger of one hand all that yield any profit to their owners. The projected strike is another move towards the total abandonment of the North Wales coal field. But what is that result, or any other, to the professional agitators, so long as they keep up their business and draw their pay. To their dupes, however, it means ruin and desolation. The slate trade is, on the whole, good, but rather unequally distributed. In the Nantlle Valley, Carnarvonshire, both Talysarn and Dorothea Quarries are busy. At some of the others, including one large one, the men are not working full time. The various shipping ports have a much more lively appearance than they had some time back. There is an increased activity in the general work of the district, and men are well employed.

TRADE OF THE TYNE AND WEAR.

Sept. 20.—The steam coal works on the north side of the Tyne continue to be fairly employed. The termination of the war in Egypt is expected to have a good effect on the trade. Already there is a larger speculative demand for Alexandria and the East generally. The French demand for steam coal also continues good, and prices are well maintained. Steam small coal also continues in good demand. The decision of the Northumberland miners not to cease work on Oct. 1 has given much satisfaction. What the Durham miners will do in the matter has not transpired; but it is well known that the men in this county are not at all satisfied with the operation of the present sliding scale, and this may lead to complications. There will doubtless be a demand made for an advance of prices. The coking and gas coal works in Durham continue to be well employed, and there is a very large output of these coals. The house coal trade is also improving, and this coal is held very firmly at the late advance in price. At the Chilton Colliery, Ferry Hill, the Brockwell seam has been reached in the sinking. The seam is of considerable thickness, but it is divided by bands. The coal trade generally is steady this week. Shipments are better, with more arrivals, and the local demand for house coal is improving; many dealers in various parts of the country are getting stocks in anticipation of labour difficulties. We observe, however, that in Scotland coals are weak. The price of steam coal at the pits is only 4s. 6d., and are shipped at Burntisland at 6s. per ton.

The lead mining trade in Teesdale and other localities in this district has long been in a depressed state. The lead miners are earning low wages, not more than 18s. per week. The prospect for this trade has, however, improved a little of late. A fine new vein of lead has been cut by the London Lead Company in the Lady's Bake Mine, Harewood, which is expected to yield 4 tons of lead to the fathom. The new vein is in what is called the Ashgill Lead Lease, is near the Green Hurth Mine, and is in the same stratification as the Green Hurth was first found in. The price of lead is still very low, but has improved a little, and there ought to be, with small imports and with a growing demand for building purposes, a better future for this ancient mining industry, which is the chief support of these valleys.

The West Cumberland miners have considered the question of an advance of wages, and they will demand an advance this week of 10 per cent. Negotiations are now being opened between the miners and the coalmasters, and it appears to be probable that they will get some advance, and that a new sliding scale will be arranged.

In an able article on the coal trade crisis in the Newcastle Daily Chronicle we find some instructive statistics in connection with the coal trade of the district. First, as to the coal produced by each man.—Durham District: In 1873, 335 tons; 1875, 339 tons; 1877, 351 tons; 1879, 350 tons; 1881, 392 tons. In 1873 the average price of coal in the same district was 15s. 10d. per ton, and the wages of the miners were also very high, and in 1881 the value of coal was only 4s. 8d. per ton, and the wages of the men proportionately low; it is, therefore, clear that low wages induces the men to produce more coal; the natural desire to earn money causes this, and thus the value of coal and wages are both kept down to a considerable extent. In the year 1871 coal was, we believe, at its normal value in Durham—5s. 2d. per ton; at the present time its value is 4s. 8d. per ton, but it is gradually increasing in price, and may be shortly expected to reach again the level of 1871, when the men will also get increased wages.

The North-East Coast Exhibition is now in perfect order. The diving bell is at work, and descends every half-hour; the charge for a submarine voyage is 1s., and this novel entertainment is a great attraction. There was a grand display of life-boats and life-rafts on the sea on Saturday. On Wednesday Sir James Douglas, Engineer to the Trinity House, London, explained the various exhibits supplied by that Institution. The new six-ring Douglas burner of 90,000 candle power is placed in one of the galleries, and it is lighted by gas; the effect is dazzling, and it is so powerful that it quite puts in the shade the electric lamps. The various systems of electric and patent gas lighting are more completed, and altogether so grand a display of illuminating power has never been witnessed in the North. Messrs. Black, Hawthorn, and Co., of Gateshead, exhibit fine specimens of locomotives. Amongst them a small four-wheel engine of light weight, with cylinders 5 in. diameter, 10-in. stroke; wheels 20 in. diameter for a railway 3-ft. gauge, working pressure 100 lbs. per square inch. The weight of this beautiful little engine in working order does not exceed 3½ tons, and it will pass round curves 10 ft. radius. Mr. W. Smith exhibits his patent anchors. One of these weighs 6½ tons; it is for H.M. ship Collingwood. The other type of anchor shown (68 cwt.) is for Cunard steamer Aurania. The others of various sizes for yachts, &c. Messrs. Smithurst and Southern, of

Guisborough, have some fine steel exhibits, castings, &c. There is a propeller blade, &c., which attract much attention. Messrs. Clarke, Chapman, and Gurney, of Gateshead, show a large number of these specialities. There is a special quick speed steam-winch for rapidly dealing with cargo of any kind, which is a most effective machine for the purpose. There is also a well-finished specimen of their ordinary horizontal steam-winch; the merits of this winch are well known and appreciated, as upwards of 7000 of them have been sold. They also show small donkey feed-pumps of a most simple and effective kind, and various other machines for working by steam the steering and all other necessary work on board ship. Some specimens of steel from the Parkhead Forge, Glasgow, shown by Mr. Kelsey, the agent of the firm here, are worthy of notice. One is a steel-built crank shaft for Messrs. Palmer and Jarrold, and it weighs 9½ tons. A bar of steel 80 ft. in length has been bent into the name of the firm; it is one of the curiosities of the Exhibition. Those bars are rolled up to 120 ft. A large steel ingot is also shown, and also a model of the famous steam-hammer "Samson," which strikes a blow of 400 tons. These are all specimens of Siemens-Martin steel, and are punched and bent cold. Here are also test pieces for H.M. ships *Arethusa* and *Leander*. A sample of steel boiler-plate also punched and bent cold. A different kind of material, also of high quality, by Messrs. Casley and Co., of St. Peter's-on-the-Tyne; samples of forgings rough from the hammer, screw shafts and posts, connecting-rod, &c. Those works are capable of producing 1000 tons of forgings and 1500 tons of anchors and chains annually. One of the most attractive stands is that of Messrs. Beck and Co., of Southwark, London, and several other London manufacturers have stands.

In connection with the coal trade, Messrs. Potter and Hair, of the Shire Moor Colliery, on the Tyne, show a model of a patent screen for preventing the breakage of coal. The machine invented by Messrs. Hair and Potter is self-acting, excepting that the screens have, by altering the position of the pins, to regulate the descent of the tray as the wagon fills, and all this done without any loss of time. The Exhibition has been highly appreciated by engineers and the general public, as is shown by the fact that it has been visited by an immense number of people. On one day (Saturday) 18,000 persons visited the very remarkable and useful display.

Clayton's patent "Excelsior" gas engine is now being used for working the air-pumps for diving bell on the sands. This engine now being brought before the public by the patentee, Mr. S. Clayton, is the result of much labour on the part of the inventor, but after devoting his time to the improving of various parts of the working and action of his patent now brings before our notice what he believes to be a simple, efficient and cheap motion. The principles of the engine may be stated as follows:—It has two cylinders, one the mixing and the other the working cylinder. The mixing cylinder is for the purpose of drawing in a thoroughly diluted mixture of air and gas on the piston's ascent, and on the descent of the piston it is forced into the working cylinder, still more thoroughly mixing it, as by so doing it has been found to be the most effectual way of getting a proper lighting mixture. On the descent of the working piston the charge is compressed previous to being ignited. The makers of the engine claim that one of the greatest improvements in gas engines is the abolition of the slide-valve, it being held that the slide-valve of an engine of the best construction consumed about 10 per cent. of the actual power developed by the engine. Thus in this engine a small portion of the charge intended to work the engine is allowed to pass a small regulating screw into a chamber where it is ignited by a new process, Watson's patent igniter, perfected by Mr. Clayton, and which is an entire novelty in gas engines, and perhaps the most effectual igniter yet introduced, as it dispenses with valves altogether. No expensive surface is required, no liability of blowing through as is the case of all other gas engines. At the proper time it is trapped in the chamber by the descent of the ordinary mushroom valve, and then passed into the charge of air and gas, igniting the same and propelling the engine. It is claimed that the arrangement of this engine is very simple, and is not liable to get out of order, and requiring but little attention. The proprietor states that these engines are made horizontal as well as vertical, and those in use have given great satisfaction. The sizes they are made, their adaptation for small industries, and prices combined render them a useful and economical motor for small works.

One of the most interesting and popular sights in the Exhibition is the diving-bell on the sands, working in a tank specially prepared for the convenience and instruction of visitors. Anyone may descend in the bell accompanied by the diver, for which a charge is made. The depth of the salt water tank is about 12 ft., and is sufficient to show the means by which some of our most interesting and wonderful submarine engineering operations are accomplished, including those great works at the mouth of the River Tyne—the north and south piers. Here the diving-bell descends to a depth of 40 to 50 ft., and the divers whilst arranging and fixing blocks of masonry 10 tons weight and upwards have to contend with the effects of the tremendous swells which sweep into the mouth of the river, often dashing the bell, which weigh about 5 tons, a considerable distance. The signalling in the bell is accomplished by means of the telephone; if that fails then recourse is had to jowelling, one blow on the side of the bell meaning that more air is required, two to stop, three to lift, gently double three hoist right up to the top, four to lower, five north, six south, seven west, eight east, and so on. The diving-bell exhibited is supplied with air-pumps, which are worked by S. Clayton and Co.'s patent silent gas engines. [This engine has worked from the opening of the Exhibition, without the slightest hitch, at a speed of 160 revolutions per minute, and is one nominal horse-power. Mr. J. A. G. Ross is the district agent for the gas-engine.]

It will be seen from the short description we have given of the various exhibits that the original idea of a marine exhibition has been greatly expanded, and it has, to a great extent, become a general exhibition of engineering and iron and steel manufactures, not only for this district, but embracing the products of most of the principal works in this country.

The iron trade has been rather dull this week. There has, however, been an undertone of firmness visible, and this is likely to be maintained so long as the demand for shipment continues so good. The deliveries lately have been close on an average of 3500 tons per day from the Tees. There is more enquiry from America, and an order for 1500 tons has been received, and a demand for steel rails is also expected. The restriction with the Scotch iron trade is generally looked upon as being at an end, although the negotiations are not altogether broken off. The prices have been very steadily maintained both for pig-iron and manufactured iron, but there is no change of importance. The business doing for existing contracts continues large, and the manufacturers have generally work in hand to occupy them until Christmas. The wages question has settled down to the point that the employers ask—a reduction of 7½ per cent. Producers in the finished iron trade ask 6½. 5s. for bars, 6½. 2s. 6d. angles, and other iron in proportion, and 4½. 6d. is the usual quotation for No. 3 pig-iron. Messrs. Connal's stock is now 113,130 tons—a reduction of 935 tons on the week. The shipments of pig-iron for the week is 23,000 tons. The coal and coke trades at Middlesbrough are firm, with no change in price.

NEW STEAM TRAM-CAR.—The Calcutta Englishman of July 31 states that the Lieutenant-Governor, accompanied by his private secretary, proceeded on July 29 to the Tramway Company's premises, at Bhowanipur, to inspect and test the merits of a steam tram-car, lately taken out to India, and which it is thought will be found useful as applied to tramways laid along ordinary Indian roads. The Lieutenant-Governor was received by several gentlemen, amongst whom were Messrs. Carlisle and Cheetham, of Messrs. Carlisle, Nephews, and Co., agents for Universal Steam Tram-car Construction Company. The trip consisted in the car running up a portion of Chaurighi, back again down to Kalighat and to the depot. The car glided along with exceeding smoothness, and was hardly noticed by the horses in the streets. It was a source of much attraction, however, to passers-by, the majority of whom very probably had never seen a knife-board before. The peculiarity of the invention is that the motive power and accommodation for passengers are contained in one structure,

the machinery being so placed as to be next to invisible. The car being worked from either end, the driver always in front, has them completely under his control, whether in starting or stopping. These steam tram-cars are able to take the ordinary gradients on public roads at the same speed as along the level. They can even take steep gradients when loaded with the full complement of passengers.

Registration of New Companies.

The following joint-stock companies have been duly registered—

THE ATLAS WAGON COMPANY (Limited).—Capital 10,000*l.*, in shares of 5*l.*. To purchase certain works at Cardiff, and carry on the business in connection therewith. The subscribers (who take one share each) are—G. B. Dyer, Cardiff; L. Wood, Cardiff; J. Fry, Penarth; J. Bovey, Penarth. W. Manner, Cardiff; E. Bregon, Cardiff; M. Holme, Cardiff.

THE DUCHY DUPLEX ELECTRIC LIGHT, POWER, AND STORAGE COMPANY (Limited).—Capital 50,000*l.*, in shares of 1*l.*. An electrician's business in connection with certain patents. The subscribers (who take one share each) are—W. J. Thomas, 81, Mildmay Park-road; A. Harvey, Tottenham; A. Clegg, East Dulwich; T. Williamson, Islington; W. J. Twentyman, Stoke Newington; W. Reynolds, Norbiton; J. K. Runden, Rye-lane.

THE BELCHER MINING COMPANY (Limited).—Capital 25,000*l.*, in shares of 5*l.*. To adopt and carry into effect an agreement made between E. M. Johnson of the one part, and the company of the other, relative to the purchase of the lands, mines, and premises situate on Sultan Mountain, in the Las Annamas mining district, San Juan county, State of Colorado, and to acquire also the mining rights known as the Belcher Mine, near Silverton, same State, for the purpose of carrying on all operations incidental to mining. The subscribers (who take one share each) are—P. P. Gaskell, jun., Carlton Club, gentleman; T. K. Weir, Gresham House, metal broker; K. H. James, 10, Austin Friars, metal broker; C. H. Weir, Gresham House, clerk; R. S. Archibolt, 9, New Broad-street, merchant; T. V. Anthony, Gresham House, metal broker; J. A. Weir, 1, Crosby-square, merchant.

THE BAY OF ISLANDS MARBLE COMPANY (Limited).—Capital 30,000*l.*, in shares of 1*l.*. To acquire and work quarries, quarrying rights, lands, and premises in Newfoundland or elsewhere. The subscribers (who take one share each) are—A. Gray, 17, Laurence Pountney-lane; J. Leslie, Brixton; F. Skinner, 3, Adams-court; J. Williams, 16, Charles-street; J. W. Wright, 36, King William-street; C. Shott, Truro; J. B. Fryer, 2, Clifford's Inn.

THE LAPPALE TUNNEL BRICK COMPANY (Limited).—Capital 30,000*l.*, in shares of 5*l.*. To acquire and carry on a brickmaking business in California, Harborne, Staffordshire. The subscribers (who take one share each) are—J. Garlick, Saltley; A. H. Gibson, Birmingham; R. Whitehill, Aston; C. Baker, Birmingham; R. Garlick, Saltley; A. Wartonby, Birmingham; J. Hateley, Edlington.

KAYE, HIRST, AND COMPANY (Limited).—Capital 2000*l.*, in shares of 5*l.*. The business of coal and clay mining, and the manufacture of terra-cotta chimney tops, drain pipes, &c., and to acquire and work the mines, plant, and machinery of the Albert Brick and Coal Company (Limited), at Rhos, near Ruabon, county of Denbigh. The subscribers (who take one share each) are—C. Kaye, Lockwood; J. S. Hirst, Huddersfield; H. Kaye, 40, Hunter-street; J. B. Robinson, York; J. W. Hirst, Huddersfield; R. Ainley, Golcar; C. Cockcroft, Huddersfield.

LONDON AND ICELAND TRADING ASSOCIATION (Limited).—Capital 25,000*l.*, in shares of 10*l.*. The business of merchants, agents, and owners of steam and sailing vessels, and to acquire and develop land in that island, the Faröe islands, or elsewhere. The subscribers (who take 10 shares each) are—E. F. Duncan, 72, Old Broad-street; W. C. Meates, 3, Austinfriars; E. Hatton, 72, Old Broad-street; F. H. Grove, 15, South Audley-street; P. Turner, Reform Club; A. Storer, The Albany; W. Turner, Chester.

FERRANTI AND INCE (Limited).—Capital 240,000*l.*, in shares of 5*l.*. The business of an electrician in all branches in connection with certain acquired patents and privileges. The subscribers (who take one share each) are—S. F. Ferranti, 24, Richmond Gardens; A. Thompson, 8, Guildford-place; F. Ince, St. Benet's Chambers; F. A. Holman, St. Benet's Chambers; W. Temple, 34, Leadenhall-street; G. Hogan, 14, Bernard-street; R. A. Cook, Croydon; R. Hammond, 110, Cannon-street.

THE ANGLO-AMERICAN PATENT DEVELOPMENT COMPANY (Limited).—Capital 50,000*l.*, in shares of 1*l.*. To acquire, develop, and use any patents, patent rights, privileges, licenses, &c., in the United Kingdom or elsewhere. The subscribers (who take one share each) are—H. Cordery, 143, Haverstock-hill; J. Downie, Upper Tooting-lane; P. O'Halloran, 28, Southampton Buildings; J. H. S. Banks, Somerset House; J. Todd, Clapham; R. W. Mordaunt, 69, Fenchurch-street; W. Downie, 28, Southampton Buildings.

THE BRADA MINES (Limited).—Capital 10,000*l.*, in shares of 1*l.*. To take over and carry into effect a contract entered into between R. Rowe, A. Grant, and W. Baxter, of the one part, and John Davies, as a trustee for this company, of the other part, for acquiring the lease of certain mineral properties situated in the Isle of Man, and granted by her Majesty's Forest and Works Commissioners to R. Rowe, A. Grant, and W. Baxter. To work and fully develop this or any other property, and to deal in, purchase, sell, and dispose of ores and minerals, goods and machinery generally. The subscribers (who take one share each) are—R. Rouse, Maidon, M.E.; A. Grant, Founder's court, banker; W. Baxter, 184, Gresham House, gentleman; J. Davies, 99, Gresham House, accountant; J. F. Copeland, Penze, secretary; J. Bowden, 3, Canonbury Park, North, merchant; T. Sissons, East Dulwich, gentleman. The number of directors must not exceed seven or be less than two. Qualification to be the holding of one share or upwards of the ordinary share capital, the subscribers to elect the first directors.

THE STEAM CULTIVATING COMPANY (Limited).—Capital 10,000*l.*, in shares of 5*l.*. The business of general engineers, machinists, tool and implement manufacturers, &c. The subscribers are—S. J. Boyce, 46, Queen Victoria-street, 20; C. F. J. Jennings, 97, Cannon-street, 10; S. G. B. Wollerton, St. Mary Cray, 1; A. J. Unwin, Cogger's Hall, 20; T. Bryce, Hackney, 20; V. Dussel, Greenwich, 1; A. M. M. Forbes, 97, Cannon-street, 1.

DENVER GOLD MINING COMPANY (Limited).—Capital 60,000*l.*, in shares of 5*l.*. To adopt and carry into effect an agreement made between the Quartz Hill Consolidated Gold Mining Company (Limited) of the first part, F. F. Powell and C. H. Dunhill of the second, and J. J. Truran, on behalf of this company, of the third part, having reference to a mining property, situate in Gilpin County, State of Colorado. To work and develop this or any other property coming into the possession of the company, and generally to conduct mining operations in all branches. The subscribers (who take one share each) are—F. F. Powell, 11, Warrford-court, shareholder; P. Marshall, 18, Finch-lane, stockbroker; R. K. Hamilton, Bermondsey, clerk; H. R. Bate, 137, Union-road, clerk; L. Fletcher, 10, Park-street, accountant; T. Wickstead, 37, Gladstone-street, clerk; A. M. Jay, 17, Old Broad-street, stockbroker. The following are the first directors—Messrs. Powell, Marshall, and Jay; the number must not be less than three or more than five; qualification 400 shares.

LIVERPOOL, BARROW, AND WEST CUMBERLAND STEAMSHIP COMPANY (Limited).—Capital 50,000*l.*, in shares of 1*l.*. To carry on the business of a shipowner in all branches. The subscribers (who take 10 shares each) are—R. W. Richardson, Liverpool; W. G. Richardson, Liverpool; J. Fletcher, Liverpool; J. W. Wood, Liverpool; J. J. Timms, Birkenhead; J. Mossop, Liverpool; J. Wilson, Liverpool; A. Young, Liverpool.

UNION BANK OF LONDON becomes incorporated under the Limited Liability Companies Acts.

MANCHESTER HOUSE AND SHOP COMPANY (Limited).—Capital 20,000*l.*, in shares of 100*l.*. The acquisition of land, erecting thereon, selling, letting, or otherwise dealing in shops, houses, premises, &c. The subscribers are—J. Craven, Manchester, 25; A. Taylor, Manchester, 5; T. Craven, Charlton-cum-Hardy, 20; W. Leak, Manches-

ter, 4; W. Hawson, Salford, 3; J. Smith, Manchester, 1; C. A. Longley, Manchester, 1.

FORDER AND COMPANY (Limited).—Capital 50,000*l.*, in shares of 50*l.*. To purchase and carry on a carriage maker's business in Wolverhampton and London. The subscribers (who take one share each) are—F. Forder, 7, Upper St. Martin's-lane; L. Thompson, 7, Upper St. Martin's-lane; R. C. Eames, Chiswick; Y. Crawley, Finsbury Park; J. Finlater, 33, Wellington-street; H. Davis, 8, High-street; R. Murs, Wolverhampton.

THE SOUTH WALES STEAMSHIP COMPANY (Limited).—Capital 26,000*l.*, in shares of 100*l.*. Steamship owners' business in all branches. The subscribers (who take one share each) are—E. Jones, Cardiff; S. Evans, Cardiff; W. W. Jones, Cardiff; F. S. Sharpe, Cardiff; J. O. Jones, Cardiff; D. Davies, Cardiff; E. Hughes, Cardiff.

THE WELLINGTON MILL COMPANY, GREAT HARWOOD (Limited).—Capital 20,000*l.*, in shares of 500*l.*. To acquire certain mills, and to continue the business of spinning and manufacturing cotton. The subscribers (who take one share each) are—N. Smith, Great Harwood; J. Mark, Great Harwood; J. Clayton, Great Harwood; C. Smith, Great Harwood; J. Boardman, Great Harwood; E. A. Smith, Great Harwood.

THE LANCASHIRE MAXIM-WESTON ELECTRIC COMPANY (Limited).—Capital 100,000*l.*, in shares of 1*l.*. To light thoroughfares, streets, factories, mines, towns, &c., in Lancashire, Cheshire, and North Wales. The subscribers (who take one share each) are—J. T. Campbell, 17, Warwick-street; H. E. Hooper, 17, Warwick-street; H. Watt, 93, Leadenhall-street; J. B. Cox, 93, Leadenhall-street; F. Gerrard, 93, Leadenhall-street; C. J. Lewis, 3, Sugar Loaf-court; E. Gribble, 93, Leadenhall-street.

THE AFRICAN DRY PLACER GOLD AMALGAMATOR COMPANY (Limited).—Capital 500,000*l.*, in shares of 20*l.*. To acquire, use, manufacture, and sell a patented machine, known as the "African Dry Placer Amalgamator," and carry on the business of gold miners, gold washers, and winners, and workers of quartz, auriferous deposits, ores, minerals, and mineral substances, and to refine, smelt, or otherwise treat any metal, &c. The subscribers (who take one share each) are—C. Hoar, 11, Leadenhall-street, timber merchant; H. M. Cumming, 154, Fenchurch-street, umbrella maker; F. Hoar, Forest Hill, architect; T. Thorn, Woodford, no occupation; W. Middleton, Haverstock, gentleman; G. Davies, 210, Brockley-road, gentleman; W. Fennell, Leytonstone, gentleman.

THE TOLLINGTON COMPANY (Limited).—Capital 12,000*l.*, in shares of 100*l.*. To purchase or otherwise acquire any land, leases, licenses, or grants, mines, or mineral properties necessary for the purposes of the company, and to carry on all operations connected with mining. The subscribers (who take one share each) are—A. J. Paine, Stepney, clerk; E. Clarke, 1, Blenheim-street, solicitor; W. Martineau, 6, Great Winchester-street, civil engineer; J. Bergtheil, 38, Warwick-road, merchant; H. H. Collins, 61, Old Broad-street, architect; E. W. Clarke, 157, Ladbroke Grove-road, bootmaker; G. W. Richards, Old Swinford, medical student; M. Marcus, 68, Russell-square, gentleman; L. M. Bergtheil, 3, West-street, accountant.

HATCHETT'S HOTEL COMPANY (Limited).—Capital 50,000*l.*, in shares of 10*l.*. To acquire these premises and continue the business in connection therewith. The subscribers are—H. D. Davies, Poultry, 500; W. Bailey, 105, Commercial-street, 100; A. Johnston, 44, Finsbury Pavement, 100; J. Pound, 81, Leadenhall-street, 100; A. Start, 5, Mark-lane, 10; J. W. Tyler, Snaresbrook, 10; W. H. Wilkin, 5, Russell-square, 100.

JOHN NUNNERLEY AND COMPANY (Limited).—Capital 20,000*l.*, in shares of 10*l.*. To purchase, sell, and deal in clay, lime, cement, laths, fire-bricks and tiles, &c. The subscribers (who take one share each) are—H. Roberts, Warrington; T. Looker, Warrington; J. E. Warren, Warrington; S. Crossley, Altrincham; J. Crossfield, Warrington; C. Broadbent, Warrington; H. S. L. Gurney, Warrington; J. H. Gurnall, Warrington.

GRAND HOTEL, EASTBOURNE (Limited).—Capital 30,000*l.*, in shares of 5*l.*. To purchase and carry on an established business. The subscribers (who take one share each) are—T. Fry, Lee; E. G. Barnett, Ilfracombe; J. Sharland, Sydenham; J. W. Gascoigne, 106, Portobello-road; N. Horne, 180, Portobello-road; J. R. Clean, Eastbourne; H. Gascoigne, 6A, Victoria-street.

PATENTS FOR INVENTIONS FOR 1881.—The annual report of the Commissioners of Patents for the year 1881 states that the number of applications for letters patent for the year was 5751, being 234 more than for the preceding year. The number of letters patent sealed was 3948, of which 68 lapsed in consequence of the patentees having neglected to file final specifications in pursuance thereof, leaving 3880 in force. Of this latter number final specifications were filed in respect of 3621, complete specifications being filed in respect of 259. Applicants failed to seal their patents in 1798 cases, opposition was offered in four cases, and one application stands over through the decease of the applicant. A table is given showing that about 65 per cent. of the applications for patents from 1852 to 1881 became valid patents, that of the valid patents obtained upon the applications from 1852 to 1874 nearly 30 per cent. paid the third year's stamp duty of 50*l.*, and continued in force until the end of the seventh year, and that about 10½ per cent. paid the seventh year's stamp duty of 100*l.*, and, consequently, remained in force for the full term of 14 years. The descriptions of inventions deposited and filed in the office under the new law from Oct. 1, 1852, when the Patent Law Amendment Act came into operation, in relation to 113,379 applications for patents have been printed and published with drawings in outline. The specifications of patents under the old law from the earliest period at which specifications were enrolled, 13,561 in number, have been printed and published in like manner. The old and new law specifications amount together to 126,940. Abridgments of the specifications of patented inventions are prepared and published in classes, each confined to one subject or group of subjects in order to facilitate the searches of inventors who are desirous of ascertaining if their inventions are novel. This series of works, which will consist of about 110 subjects, when completed to the end of the year 1876, will afford in a compact form a key to the inventions patented under each subject between the years 1817 and 1876. Thenceforward the volumes of abridgments will be published for decennial periods. Copies of the Commissioners' publications are sold at cost price at the Sale Department, Curator-street. The receipts from the sale of these publications during the year 1881 amounted to 2912*l.* 4*s.* 4*d.* The Patent Museum at South Kensington has been visited from its opening on June 22, 1857, to the end of the year 1881, by 5,257,000 persons. During the year 1881 there were 282,121 visitors. During the year 1881 91 ornamental and 137 useful designs were provisionally registered, and complete registration of 15,176 ornamental and 128 useful designs was effected. There were also three designs registered for sculpture. The report is signed by the Lord Chancellor, the Master of the Rolls, and the Attorney-General and Solicitor-General.

ELECTRO-GENERATIVE FUEL.—At the recent meeting of the French Association for the Advancement of Science, Dr. Brard, of La Rochelle, read a paper before the Physical Section, in which he described a new method of generating electricity by the combustion of a peculiar kind of fire-slab. This slab consists of a brick of carbonaceous matter and a brick of nitrate of soda or nitrate of potash, placed together, but separated by a thin sheet of asbestos paper, and both enveloped in a wrapper of asbestos. The carbon brick is formed of about 100 grammes of coal dust kneaded into a paste with tar or molasses, and shaped in a mould by heat. The mould gives the brick a pitted surface above, and perforates it with holes through and through from the upper to the under side. Strips of brass or copper are also embedded in the under side of the brick to serve as an electrode for the carbon pole of the electro-generative element. The other brick consists of a mixture of three parts ashes and one part nitrate of potash or soda, melted together and poured upon the pitted surface of the carbon, which, however, is first covered with a layer of asbestos paper. Strips of brass are also embedded in this compound to serve as an electrode. The slab thus formed constitutes a generator of electricity when wrapped in asbestos and placed in a furnace or fierce fire. In such an element the carbon

forms the negative plate, and is oxidised just as zinc is oxidised in the ordinary voltaic cell; the nitrate of potash being the oxidising substance. The slab becomes a thermo-chemical battery, and Dr. Brad states that an electric current is obtained strong enough to actuate an ordinary electric bell. By connecting up several of these elementary slabs after the manner of a voltaic battery, a more powerful current is the result, three or four cells being sufficient to decompose water.

MINING ENTERPRISE ON A SOUND BASIS.

The enormous riches derived by the Spaniards from their American possessions have been the constant theme of historians for centuries, but great as was the quantity of the precious metals obtained by them, it is beyond question that they merely commenced the development of the deposits they discovered, and that many rich districts were comparatively if not entirely untouched; whilst it is recorded that in no parts of South America did the Spaniards find the Indians possessed of such an abundance of gold and silver as in the extensive territories which now constitute the United States of Colombia, or New Granada, as it is, perhaps, more familiarly called by many Englishmen, who have within the past few years given considerable attention to it as a field for mining enterprise. Already the names of several companies having British capital engaged in working mines in this region occupy a respectable position in the Dividend List, and the sound and equitable principle upon which the two latest Colombian concerns—the Organos and the Oritá—have been formed promise to bring the United States of Colombia into great prominence as one of the most remunerative foreign mining regions of the world. It is estimated that the Spaniards received no less than 2,000,000,000 of worth of the precious metals from the extensive territories of which Colombia forms one, and there is no reason to doubt that a still larger amount remains available to reward the greater engineering skill and increased scientific knowledge that can now be brought to bear upon its extraction.

In almost every company formed within the past 20 years the capital account has been so heavily loaded—by the creation of shares to represent payments to vendors and promoters, and therefore entitled to claim dividends, although they have done nothing towards providing working capital—that it is really surprising that mines have been able to show so much prosperity as they have, for more than one instance could be mentioned where the profits earned with but 20,000 of working capital has had to be distributed as dividends upon a nominal capital of 250,000, or even more. This is most unfair to the reputation of mining, and this unfairness has now become so widely recognised that the restoration of the sound principle of securing every capitalist a share of the profits in exact proportion to the actual cash subscribed by him has caused the Organos and Oritá companies to prove greater successes from a financial point of view than any which have been placed on the market for several years past. The Oritá Gold Mines, which allotted its shares last week—which shares are now quoted $\frac{1}{2}$ to $\frac{3}{4}$ prem. on the Stock Exchange—has a well situated property in the State of Tolima, 5760 acres (9 square miles) in extent, and as neither purchase nor promotion money has been or will be paid every shilling subscribed is applicable to the working of the mines. No doubt is entertained that the result of the development will be to demonstrate that the estate is at least as valuable a mining property as its rich neighbours, and the company can then exercise the option that has been secured to it in purchasing the freehold for rather less than 5s. 6s. per acre. As the estate contains every requisite for the prosecution of hydraulic work, and as the auriferous gravel is reported to be inexhaustible, it is unnecessary to state that operations will be commenced under unusually favourable auspices.

Californian experience has established the fact that with the hydraulic process the same amount of work can be done for 1 cent as cost \$1 with the system which it displaced, and this estimate was made upon the very liberal basis of allowing 12s. per day for the miners' wages; all that is necessary to secure this advantage being a good head of water and care in utilising it. At the Oritá property there need be no difficulty in this connection, for not only have they magnificent timber on the spot for the construction of sluices and flumes, but there is a river which contains 3500 miners' inches of water, which at a moderate outlay can be brought to command the principal mines at a height of 500 ft., and there is abundance of labour to be had at 2s. per day, which is widely different from the amount mentioned even in the favourable estimate just alluded to. The Oritá Company propose to commence operations at a point on the estate where the gravel prospecting by a neighbouring company has proved very rich, yielding them with a very small head of water 6000 of per annum profit. On the Oritá property a ditch has been laid out and the construction commenced, which will give the company seven times as much water as that now being used by their neighbour, and a careful calculation shows that with a monthly expenditure for working and royalty of 1212s., a produce of gold dust worth 4984s. may be obtained, leaving a profit of 3772s. per month. As the company's capital is but 20,000 of, it follows that this return would permit of the return of the whole of the capital now subscribed, and the purchase of the freehold is considerably less than two years, although a large margin be left for contingencies and delay, so that the promoters have every justification for anticipating that the shareholders may expect a return of the whole of their investment in dividends during the first few months after the completion of the works.

The reports of Mr. W. S. Welton, the superintendent of the Colombian Hydraulic Company, and of Mr. W. Hoskin, of the Santa Ana Mines, are highly encouraging. Mr. Welton remarks that having resided for the last 22 years in the immediate neighbourhood of the Oritá estate he feels himself fully qualified to give an opinion on the subject, and he has no hesitation in saying that if the mines be worked in the manner recommended by him they cannot fail to be one of the most remunerative works of the kind in the world. Mr. Hoskin states that the property is provided with abundance of timber and water, it is apparently temperate and healthy, and it offers a fine field for hydraulic mining on a large scale. He carefully examined the adjoining mine before going over this property, and there can be no doubt of the deposit being one and the same. The company has evidently a most promising estate to operate upon, and if the management be as good as the principle upon which the company is inaugurated the public will have no reason to regret the support they have given to it.

GLOSSARY OF MINING AND METALLURGICAL TERMS.—Although it is a somewhat unusual proceeding to present a glossary of technical terms as a paper to be read before a scientific society, and although it might prove somewhat trying to the patience of the members to have to listen to the re-reading of, yet considered on the score of utility no objection to it can reasonably be raised, and in the case of Dr. E. W. Raymond's, which has just been reprinted as a separate work from the Transactions of the American Institute of Mining Engineers (London: Trübner and Co., Ludgate Hill), there is the additional compensation that the author has had unusual facilities for collecting data, and has also had the hearty co-operation of his professional colleagues. The glossary occupies 90 large pages, and has been prepared with special reference to the requirements of readers of mining and metallurgical works, in which the technical expressions in ordinary use among practical men are used. Great attention appears to have been paid to the American terms, and the work, as a whole, is likely to enjoy a high reputation as a work of reference.

AMERICAN IRON TRADE.—The American Iron and Steel Association has just issued a valuable Directory of the Iron and Steel Works of the United States, embracing the blast-furnaces, rolling-mills, steel works, forges, and bloomeries in every State and territory, and corrected to July 25 of the present year. The volume, which is published by the Association at their offices in Philadelphia, furnishes very ample details concerning the capacity of each works, and is prefaced by a useful summary showing in American tons (about 18 cwt.) the resources of the trade. Expressed in standard tons, the annual capacity of completed blast-furnaces in pig-iron is about 7,200,000 tons. There are 393 completed rolling-mills and steelworks, and 16 in course of building. The annual capacity of

the rolling-mills in finished iron and steel is about 6,300,000 tons. There are 38 Bessemer converters of the capacity in ingots of about 2,000,000 tons. There are 61 open-hearth furnaces of the capacity of 450,000 tons, and 52 completed bloomeries of the capacity in ingots of 63,000 tons. The volume is printed with the care which characterises all the publications of the Association, and has an admirable index, which much facilitates reference.

TREATING COAL FOR TRANSPORT AND STORAGE.

The treatment of coal with a view to render it less liable to spontaneous combustion or ignition, and the expulsion of the fire-damp from the coal, which causes the explosions that frequently occur where coal is stored in confined places, has long since attracted the attention of inventors. It is generally considered that the spontaneous ignition of coal arises from two sources—the absorption and condensation of atmospheric oxygen by the carbonaceous matter of coal, and known as carbonaceous oxidation, and the oxidation of some of the sulphur compounds generally existing in coal, such as iron pyrites. In the first case, the action quickly commences by a sufficient elevation of temperature, and progresses with proportionate rapidity; in the second case, the action is comparatively slow, damp or moisture greatly promoting it, if, indeed, it be not absolutely essential; heat also accelerates the action.

Now the invention of Mr. THOMAS ROWAN, of Coleshill, consists in artificially exciting and promoting the carbonaceous oxidation of the coal before its shipment or storage. The coal is placed in suitable receptacles, by preference shallow iron trucks or waggons, with open lattice bottom and sides, and the said trucks or waggons are run into suitably constructed stoves or buildings, where the coal is subjected to the action of air heated to a temperature of, say, from about 150 degrees to 250 degrees Fahrenheit for a time varying from 24 hours to 10 days, in order thereby to artificially excite and promote carbonaceous oxidation, the time and temperature employed varying, as will be well understood, with the nature of the coal under treatment; the coal is then allowed to cool slowly, protected from the influences of the weather.

By these means he excites and promotes the absorption and condensation of atmospheric oxygen by the carbonaceous matter of the coal (otherwise known as carbonaceous oxidation) up to that point when any further action in the coal from this source could not be carried on energetically enough to cause much appreciable heating, if any, when stored as in the hold of a ship or otherwise. Moreover this process or treatment will be the means of expelling moisture and thus limiting to a minimum the action of the oxidation of the iron pyrites. Again by the same means the marsh gas or fire-damp contained in the pores and cells of the coal will also be expelled, and a dangerous element removed. Coal thus treated is then fit for storage in the holds of ships or otherwise, and will be practically freed from the liability to spontaneous combustion or ignition which until now has been the source of so much disaster to life and property, and the danger of explosion will be reduced by the quantity of marsh gas or fire-damp expelled.

DIVIDED AND SUB-DIVIDED ELECTRIC CURRENTS FOR LIGHTING.

Reference was made in the *Mining Journal* a few weeks since to the completeness of the arrangement for electric illumination made by Mr. J. B. ROGERS, of Holborn Viaduct, for the development of whose inventions a company was recently formed. The details of the inventions can now be given. He carries a series of negative and positive conducting wires radii from one central power generating station, and put their terminals in connection with other stations, which are also in connection with the several stations of that series, and also by other or subsidiary conducting wires to more distant stations, which are themselves in connection with each of the distant stations and with the intermediate stations and the main station or stations. Any or all of these stations may be provided with dividing and sub-dividing apparatus.

Any of the subsidiary stations may form a central station of a district, and be in communication with the distant districts either for use as generating stations or as storage stations, in or from which the lighting may be established, the several wires and stations being so arranged and connected that any disruption of any conducting wire between any two or more stations would not affect the circuit or destroy the continuity of the current between the several lamps within the system.

MACHINERY FOR THE DIAMOND MINES.—Some 15 months since a company with a capital of 150,000 of, in shares of 10 of, each, was formed to purchase the businesses in Kimberley and in England of Messrs. John Vernon Hope and Co., general hardware merchants and engineers. For the past 10 years the firm has enjoyed a high reputation on the diamond fields and in the surrounding districts, and a remunerative and rapidly extending business has been established. The directors having found that owing to the increase of business the capital, which was sufficient when the company was formed, is now quite inadequate to enable them to cultivate a general South African trade, and they therefore determined to offer to the public 3574 ordinary shares, at 10s. prem., being the unallotted balance of the first issue of 10,000 shares. It is understood that this new issue has been well applied for, so that the concern is now in a strong financial position. The dividends paid during the last year have been at the rate of 12 per cent. per annum, and the directors point out to intending investors that this is essentially a trading company, and, although trading at the diamond fields, is not in any way subject to the risks of mining companies. The first annual general meeting was held on Thursday, when a statement of accounts was presented, showing that after providing for all bad and doubtful debts, 12 per cent. will be paid upon the ordinary and 8 per cent. upon the preference shares of the company, in addition to which 10 per cent. has been written off all the stocks, 17 of the buildings and land, it is proposed to place 1000 of to reserve, and carry forward 1733 of 9d. to next account. All the stores and works of the company are in an efficient working state, with a replete but not excessive stock. One of the managing directors, Mr. G. F. W. Hope, proceeded to Kimberley in August 1881, and completed the conveyance of the stores, stocks, &c., to the company. The sales for the past year show an increase of about 25 per cent., which, taking into account the depressed state of affairs at the diamond fields during the last six months, is extremely satisfactory, especially as the sales for the last three months are larger than any previous quarter. The directors find that the trade has increased so considerably that the working capital, which was sufficient when the company was formed, is now inadequate for the increased trade being done; they have therefore determined to issue the balance of shares of the first issue unallotted, amounting to 3574; this will give the company 17,870 of more capital, which can be readily and profitably employed at the present time, and will enable them to largely extend their trade in South Africa, so as not to confine their operations exclusively to the diamond fields. The net profit on the year's trading is 7185 of 19s. 3d., of which 4732 of 8s. 6d. was distributed as dividends; 1000 of placed to the reserve fund, and 1733 of 9d. carried forward to credit of next account. The Chairman (Mr. D. Swift), in moving the reception and adoption of the accounts, remarked that he thought the shareholders might congratulate themselves on the success of the past year's working. Not only had they been able to declare a dividend of 12 per cent., but to place 1000 of to reserve fund, and write 10 per cent. off the net cost price of stock which was at the different works, and that included stock shipped but not yet delivered at the Cape. That of course placed the company in a very strong position. Besides, 17 of per cent. had been written off all freehold works and land, both in England and South Africa, although property both in Staffordshire, and he thought he might safely say in South Africa, had greatly increased in value during the last few years. There was no doubt they could have paid a very much larger dividend, but the directors thought it more prudent to build up a reserve fund and write off the stock. The retiring directors (Messrs. Swift and Francis) and the retiring auditor (Mr. W. Field) were re-elected, and thanks

having been voted to Mr. Simpson, the company's manager in South Africa, to the staff for the able and efficient manner in which they have carried on the company's business, and to the Chairman and directors, the proceedings terminated.

PROVINCIAL STOCK AND SHARE MARKETS.

CORNISH MINE SHARE MARKET.—Mr. J. H. REYNOLDS, stock and sharebroker, Redruth (Sept. 21), writes: The chief feature for the week has been the upward move in Dolcoaths, which have been done at 80 for the meeting, but close weaker at 80. Wheal Bassets have risen to 10, East Pools 54, Killifreths 8, but on the whole not much business doing. Subjoined are the closing quotations:—Blue Hills, 1 to 1; Carn Brea, 10 to 11; Cook's Kitchen, 42 to 43; Dolcoath, 79 to 80; East Pool, 54 to 55; East Blue Hills, 9s. to 11s.; Killifreth, 5 to 5; Marke Valley, 2 to 2; Mellanear, 5 to 5; New Cook's Kitchen, 5 to 5; New Kitty, 2 to 2; North Bus, 3 to 3; North Herodiasfoot, 3 to 3; North Penstruthal, 3 to 3; Pen-an-drea, 3 to 3; Phenix, 3 to 3; South Condurow, 9 to 9; South Crofty, 12 to 13; South Frances, 12 to 13; Tincroft, 14 to 15; Tregembo, 3 to 3; West Bassett, 9 to 10; West Frances, 10 to 10; West Kitty, 15 to 15; West Peavor, 12 to 13; West Polbreen, 4 to 4; West Poldice, 4 to 4; West Tolgus, 17 to 19; West Seton, 18 to 18; Wheal Agar, 17 to 17; Wheal Bassett, 10 to 11; Wheal Grenville, 10 to 10; Wheal Hony and Trevelny, 2 to 2; Wheal Jane, 3 to 3; Wheal Kitty (St. Agnes), 2 to 2; Wheal Peavor, 6 to 7; Wheal Prussia, 3 to 3; Wheal Uny, 5 to 5.

—Messrs. ABBOTT and WICKETT, stock and share brokers, Redruth (Sept. 21), write:—The upward tendency of the tin market has improved the value of most shares, and a good business has been done this week in the leading mines at higher rates. Subjoined are the closing quotations:—Blue Hills, 1 to 1; Carn Brea, 10 to 11; Cook's Kitchen, 42 to 43; Dolcoath, 79 to 80; East Pool, 54 to 55; East Uny, 5 to 5; Gunnslake (Olliters), 4 to 5; Killifreth, 5 to 5; Penhalla, 3 to 3; New Cook's Kitchen, 7 to 7; New Kitty, 2 to 3; New Trumpet 1 to 1; North Bus, 3 to 3; Pen-an-drea, 3 to 3; Phenix, 3 to 3; South Condurow, 9 to 9; South Frances, 12 to 13; South Crofty, 12 to 13; Tincroft, 14 to 15; West Bassett, 9 to 10; West Kitty, 15 to 15; West Poldice, 4 to 4; West Peavor, 12 to 13; West Frances, 10 to 10; West Tolgus, 17 to 19; West Seton, 18 to 19; Wheal Agar, 17 to 17; Wheal Bassett, 10 to 11; Wheal Grenville, 10 to 10; Wheal Hony and Trevelny, 2 to 2; Wheal Jane, 3 to 3; Wheal Kitty, 2 to 2; Wheal Peavor, 6 to 7; Wheal Prussia, 3 to 3; Wheal Uny, 5 to 5.

—Mr. M. W. BAWDEN, Liskeard (Sept. 21), writes:—The mining market has been moderately active, and decidedly firm throughout the week, with an upward tendency. Buyers of Dolcoath, East Pool, Killifreth, Phenix United, Tincroft, West Kitty, and Wheal Bassett shares at an advance. There is also a demand for copper mine shares on the improved price for copper. At West Phenix Mine meeting (it should be understood that this mine is not in any way connected with the property of the same name forming part of Phenix United) held on the mine yesterday a call of 1s. 6d. per 12,000th share was made. Subjoined are the closing quotations:—Bedford United, 2 to 2; Carn Brea, 10 to 11; Cook's Kitchen, 42 to 43; Dolcoath, 79 to 80; Devon Consols, 5 to 5; East Caradon, 5 to 5; East Lovell, 1 to 1; East Pool, 54 to 55; Gawton United, 4 to 4; Glasgow Caradon, 3 to 3; Gunnslake (Olliters), 4 to 4; Herodiasfoot, 2s. 6d. to 2s.; Hingston Down, 3 to 3; Killifreth, 5 to 5; Marke Valley, 2 to 2; Mellanear, 4 to 5; New West Caradon, 5 to 5; Old Gunnslake, 3 to 3; Old Herodiasfoot, 2 to 2; Old Pen-an-drea, 3 to 3; South Condurow, 9 to 9; South Crofty, 12 to 13; South Frances, 12 to 13; South Devons United, 3 to 3; South Frances, 12 to 13; Tincroft, 13 to 14; West Bassett, 10 to 10; West Caradon, 3 to 3; West Frances, 9 to 9; West Kitty, 15 to 16; West Mary Ann, 1 to 1; West Peavor, 12 to 13; West Phenix, 4 to 4, o.p.; West Seton, 18 to 18; Wheal Agar, 17 to 18; Wheal Bassett, 10 to 11; Wheal Crebor, 2 to 2; Wheal Tolgus, 18 to 19; Wheal Grenville, 10 to 10; Wheal Hony and Trevelny, 2 to 2; Wheal Kitty, 2 to 2; Wheal Jane, 3 to 3; Wheal Peavor, 6 to 7; Wheal Uny, 5 to 5.

—Mr. JOHN CARTER, mine shareholder, Camborne (Sept. 21), writes:—The Cornish share market has failed to follow up the advance in tin in the London market sharply, as in former instances, and the advance in prices has been limited to three or four mines only, such as Dolcoath, West Kitty, and Tincroft, while other shares have almost been neglected, except in the case of Killifreth and Wheal Bassett, which spurred on discoveries being made. To-day's market closes flat. Closing quotations are annexed:—Carn Brea, 10 to 11; Cook's Kitchen, 41 to 42; Dolcoath, 79 to 80; East Pool, 53 to 54; East Blue Hills, 9 to 9; Killifreth, 5 to 5; Mellanear, 4 to 5; New Cook's Kitchen, 7 to 7; New Kitty, 2 to 2; Pen-an-drea, 3 to 3; Phenix, 3 to 3; South Condurow, 9 to 9; South Crofty, 12 to 13; South Frances, 12 to 13; Tincroft, 14 to 14; West Bassett, 9 to 10; West Frances, 9 to 10; West Kitty, 15 to 15; West Peavor, 12 to 12; West Poldice, 4 to 4; West Seton, 18 to 19; West Tolgus, 18 to 18; Wheal Agar, 17 to 17; Wheal Bassett, 10 to 10; Wheal Grenville, 10 to 10; Wheal Hony and Trevelny, 2 to 2; Wheal Kitty, 2 to 2; Wheal Jane, 3 to 3; Wheal Peavor, 6 to 6; Wheal Uny, 5 to 5.

MANCHESTER.—Messrs. JOSEPH R. and W. P. BAINES, share brokers, Queen's Chambers, Market-street (Sept. 21), write:—The share markets have presented a rather dull appearance all round during the past week. There have been a few instances in which occasional stir has taken place; but, on the whole, only a moderate amount of business has been in progress. The price of money and the feeling that possibly the rate would be further augmented has checked operations; the fears, however, have not as yet been realised, and an advance is not so generally looked for as imminent now as was the case a few days back. The complete subjugation of the rebels in Egypt has caused Egyptian stocks to rule higher, and though the sudden bound from 65 highest of Friday last to 69 on Saturday is hard to account for, except as being the result of determined "bull" operations, the price now market shows only a small decline from best point reached. Inactivity has been the chief feature in the market for the several classes of investment shares, transactions being few in number. Prices do not show any cases in which serious decline is to be noted, but the balance in number of alterations is adverse.

BANKS.—Beyond a fall of $\frac{1}{4}$ in Manchester and Liverpool Districts and a slight revision of buyers figure in Union of Manchester figures remain without change. A moderate number of dealings are reported, and prices realised keep well maintained.

INSURANCE.—The share markets are still very slow of sale; where done, however, figures show little or no falling off. Quotations exhibit a decidedly weak feeling in this market, for whilst none of the concerns individually show great adverse change, the number of fractional declines is large. Lancashire Insurance show as well as any quoted here, for although only a solitary transaction is marked, buyers figure is put up $\frac{1}{4}$ without sellers responding by reducing their demands. British and Foreign Marine are $\frac{1}{4}$ higher, but United Fire Insurance are $\frac{1}{4}$ lower. Underwriters Association, $\frac{1}{4}$; Boiler Insurance and Steam power, $\frac{1}{4}$; Liverpool and London and Globe, $\frac{1}{4}$; Manchester Underwriters, $\frac{1}{4}$; Marine, $\frac{1}{4}$; Thames and Mersey Marine, $\frac{1}{4}$; and Positive Life, 3d. lower.

COAL, IRON, & MINING.—This market has produced no very violent fluctuations. Amongst the concerns where prices are not changed equally from both sides may be mentioned A. Knowles and Sons' Coal, in which quotation is narrowed. Chatterley Iron, buyer's price raised $\frac{1}{4}$, and business done at it; and West Cumberland, buyers down $\frac{1}{4}$, sellers unchanged. Some few transactions are marked in Bolckows 12s. paid, and several lots of the new issue have also changed hands. The last-named have had an advancing market, whilst later dealings in the former are at lower figures. Ebbw Vale quiet, and run lower. Some demand has sprung up for Chillingham Irons, and price shows fair advance. The aggregate of the business done herein is rather below last average. Higher: Chillingham Iron, $\frac{1}{4}$; Staveley Coal, &c., $\frac{1}{4}$; Park Gate Iron, $\frac{1}{4}$; and Tharish Sulphur, &c., $\frac{1}{4}$. Lower: Bolckows, 12s. paid, $\frac{1}{4}$; Cammells, $\frac{1}{4}$ (have been rather lower still); Tredegar, B, $\frac{1}{4}$; Ebbw Vale, $\frac{1}{4}$; Indian Trevelyan Gold, $\frac{1}{4}$; and Indian Phenix, $\frac{1}{4}$.

COTTON SPINNING, &c.—These shares keep fairly strong, with only a moderate amount of business doing. The public do not appear to be turning their attention largely to these shares at present, and consequently prices are fickle, any attempt on the part of speculative holders to realise profits putting down figures in those offered. However, as these shares are pretty well held now the fluctuations are not violent.—TELEGRAPHIC have not produced much business. Anglos have moved rather contradictorily, for whilst preferred are 1 better, deferred made a fall of $\frac{1}{4}$. Besides these changes the only others to chronicle are an advance of $\frac{1}{4}$ in Direct United States Cable, and a fall of $\frac{1}{4}$ each in Globe ordinary and preferred.—TELEPHONES quieter. Lancashire and Cheshire down about 2s., and United $\frac{1}{4}$.—CORPORATION, &c., stocks not notably altered, but little doing therein.—MISCELLANEOUS dull as regards business passing. Figures are altered in some cases, however. Hudson's Bay, after fluctuations, exhibit a rise of $\frac{1}{4}$ on the week. Manchester Carriage of all issues are distinctly better, as also are Hull Docks and Manchester Royal Exchange Buildings. Pacific Steam Navigation, Union Plate Glass, Barlow and Jones, and Rylands, all lower.

RAILWAYS.—During the week there has been a rise and a relapse in most securities. Great Eastern were looked upon in hope of good traffic return, and as this was disappointing they declined again, and are $\frac{1}{4}$ under last week's price. Brighton, A, have, as usual, shown considerable animation, after touching 123. Their statement of receipts and expenditure for the month, showing a decrease of 18,000 of, caused a quick relapse; to-day, however, they exhibit a gain of 1. The same influence South-Eastern, A, heavily, the price receding to 119, but a better tone has prevailed to-day. The heavy lines continue to drop, but no great change has occurred in others. Canadian Traffic continue good, Grand Trunks to-day returning a total increase of 10,550 of, and prices opened reasonably buoyant, but soon afterwards gave way, and only show about $\frac{1}{4}$ to advance on the week. In Americans the dulness still prevails, yet most stocks, although below the highest obtained in the week, are above figures at last report by $\frac{1}{4}$ to $\frac{1}{2}$.

HULL.—Mr. W. FOWLER SUTTON, stock and share broker, Saint Mary's Chambers (Sept. 21) writes:—The railway market has been quiet this week with a downward tendency generally, the effect of dearer money and of fears of a further rise in the Bank rate. From special causes relative to the hop and fruit crops, Dover A's have suffered the most, while the disappointing traffic of the Great Eastern has caused a drop of 2 per cent. from the highest mark. Canadian rails steady and very firm to-day on the good traffic, but the near approach of the account in the realisations, and a consequent drop in the price. The Mexican Railway traffic not being up to the extremely sanguine expectations of speculators, has depressed them about 3 per cent. from last night's closing price, but a little calm consideration would show it is, on their merits, uncalled for. The total increase so far this half-year is close upon 65,000 of, that is in two months and a half. If continued for the rest of the half-year this would in itself increase the dividend earned to about 13 per cent. per annum; the dividend for the past half-year is still contained in the present price (payable in November), and, in addition, the silver duty is removed from Nov. 1, equal to a saving of what will

pay an extra dividend of 1½ per cent., or thereabouts. Mexicans uncertain, but a considerable rise is anticipated within the next month or so. Local stocks firm. Hull Banks, 13½; Hull Docks, 76; Hull Trams, 8½; Hull Gas, 55; Hull and Barnsley, 44; paid, 2; Earle's Shipbuilding, 404, paid, 23.

SCOTCH MINING AND INDUSTRIAL COMPANIES SHARE MARKETS.

STIRLING.—Mr. J. GRANT MACLEAN, sharebroker and ironbroker, (Sept. 21), writes:—During the past week the market has been quieter, owing to the upward tendency of the money market, and perhaps the feeling that when the Egyptian matter comes to the diplomatic state that some disturbances may arise. The successful termination of the war has, therefore, not had the favourable effect on prices that might have been expected. The other influences are all favourable, as the weather is propitious for the completion of the harvest, and trade generally is improving. In shares of coal, iron, and steel companies there has been less business doing. In the Scotch pig-iron market the price of warrants has been steady, from 49s. 10d. to 50s. 4½d.; the market is firm, owing to the healthy condition of trade and cheering prospects, but the upward tendency of the money market, and the enormous output, keeps the prices low. The Monkland Company has issued its report for the last 13 months, from which it appears the agreement for restricted production has not benefited them. In fact, it has raised the cost of production without giving any compensating gain in the selling price. It has also resulted in an accumulation of stock of raw material. The actual working loss is 4184½, which includes 2382½ for depreciation. Bilson and Crump Meadow Colliery, 25s. to 35s.; Chillingham Iron, 45s. to 55s.; Llynvi and Tondur, 6½ to 7½; ditto (pref.), 65s. to 75s.; Shotts Iron, 45s. to 50; and Stourbridge Pottery, 15s. to 20s.

In shares of foreign copper and lead companies prices are generally better, in sympathy with the copper market. Tharsis has improved from 4½ to 4¼. The Norway Copper Mines are now being vigorously developed, and satisfactory results anticipated. Corporation of South Australia are at 9s. 10d. to par; Hutafall, 7s. 6d. to 12s. 6d.; Hungarian, 7s. 6d. to 12s. 6d.; Santa Cruz, 3s. to 5s.; and Yorke Peninsula (pref.), 17s. 6d. to 22s. 6d.

In shares of home mines there has been more business doing, and prices improving. Bodirris are at 2s.; Bell Vein, 5s. to 10s.; Bwlich United, 12s. 6d. to 17s. 6d.; Caron, 2s. to 5s.; East Wheel Rose, 20s. to 25s.; East Devon Consols, 20s. to 30s.; East Roman Gravel, 5s. 6d. to 12s. 6d.; East Herdofort, 5s. to 10s.; East Craven Moor, 4s. to 6s.; Frongoch, 30s. to 40s.; Great Polgoth United, 5s. to 10s.; Groynion, 10s. to 15s.; Indian Queens, 2s. 6d. to 5s.; Kit Hills, 7s. 6d. to 12s. 6d.; Langford, 5s. to 7s. 6d.; Mounts Bay, 10s. to 11s. 3d.; Trunpet, 20s. to 30s.; New West Goginan, 20s. to 25s.; North Levant, 4½ to 5½; Old Owlcombe, 1s. to 2s.; Old Shepherds, 7s. 6d. to 12s. 6d.; Parkas, 2s. 6d. to 5s.; Pennant, 35s. to 45s.; South Darren, 10s. to 20s.; St. Just United, 9s. 10d. to 11s.; Tamar, 5s. to 7s. 6d.; Treasavens, 10s. to 13s. 3d.; Tin Hill, 12s. 6d. to 17s. 6d.; West Caradon, 5s. to 10s.; Walkham United, 5s. to 10s.; West Kitty, 15s. to 20s.; Wheel Crebor, 5s. 6d. to 7s. 6d.; Wheel George, 10s. to 20s.; Wheel Kitty, 42s. 6d. to 47s. 6d.; Wheel Lusky, 5s. to 7s. 6d.; and Wheel Owles, 4 to 6.

In shares of gold and silver mines there is no particular alteration to notice. Richmond has improved from 7½ to 8; Asia Miner about par; Birdseye Creek, 20s. to 30s.; Cedar Creek, 2s. to 5s.; Central Wynand, 7s. 6d. to 12s. 6d.; Colombian Hydraulic, 4s. to 6s.; Callio Bis, 7s. to 9s.; Consolidated, 4s. to 6s.; Devala Moya, 15s. 9d. to 21s. 3d.; Indian Consolidated, 12s. 6d. to 15s.; Kolnrover, 17s. 6d. to 22s. 6d.; Kapanga, 17s. 6d. to 20s.; New Callio, 7s. 6d. to 12s. 6d.; New Gold Run, 4s. 6d. to 10s.; ditto (pref.), 3s. 6d. to 5s.; Port Phillip, 2s. 6d. to 5s.; Rio Grande do Sul, B. 11s. 3d. to 13s. 9d.; Silver Peak, 2s. to 3s.; Soubach and Catir Alao, 10s. to 20s.

In shares of oil and miscellaneous companies the feature has been a general advance in oil shares, owing to a rise in petroleum. Lawes' Chemicals 5½ to 6½, Noble's Explosives, 31½ to 31½.

EDINBURGH.—Messrs. THOMAS MILLER and SONS, stock and share brokers, Princes-street (Sept. 21), write:—The market for railway ordinary stocks since Wednesday has, on the whole, shown a movement to lower prices. The advance in the Bank rate of 5 per cent. was followed by a fall in the markets generally. Caledonian has during the week declined from 108½ to 108, and North British from 93½ to 93. The most notable change has been in East London, which advanced rather sharply from 20 to 24½. Canadians have fluctuated somewhat freely, but are ½ to 1½ under the quotations of Wednesday last. Americans have also been somewhat depressed. In mines Clyde Coal have fallen from 52s. 6d. to 48s. 6d. Rio Tinto from 28½ to 26½. Arizona Copper after being at 70s. have risen to 71s. Marbella have advanced from 6½ to 6½. Steel Company of Scotland from 8½ to 8½. Tharsis from 4½ to 4½. A demand sprung up for oil shares, and Braxburn Oil have risen from 28 to 28½, Oakbank from 35s. to 39s., Uphall from 8 to 8½. Young's Paraffin from 10½ to 11½. Prairie Cattle after receding from 15½ to 15½ came into request, and advanced to 16½, from which they again dropped to 16.

IRISH MINING AND MISCELLANEOUS COMPANIES SHARE MARKET.

CORK.—Messrs. J. H. CARROLL and SONS, stock and share brokers, South Mall (Sept. 20) write:—Markets were again steady to-day, and Great Southern changed hands at 116½ and Midlands at 87. Great Northern remain at 120, and Bandons 84. National Banks were bought at 23 15-16ths, and Munsters at 7. No change in Provincials, and Hibernians remain 3¼. Dublin Tramways were done at 10 1-16ths. Cork Steam Packets remain 10½ to 11, and Lyons 5½. Gas shares are 6 to 6½, and Goudings offered at 8½. Gresham Hotels were done at 3½, and Breweries asked for 5½.

KOHINOOR SILVER MINING COMPANY.

Preliminary to the holding of the extraordinary general meeting on Tuesday next an exhaustive circular to the directors has been issued by the managing director—Mr. F. A. Sands. The object of the meeting is to obtain the sanction of the shareholders for the creation of 20,000, debentures, and for increasing the company's capital to 100,000, by the issue of 20,000, fully-paid B shares, with the view to secure the acquisition of an excellent mill, called the Freeland Mill, now in full work, and of an extremely valuable mine known as the Champion Mine, of the same character as the Donaldson, and in its vicinity. The mill property, with three lodges, each of 1500 ft. connected with it, can be acquired for 56000, 10000, payable on completion of purchase, and balance in instalments extending over one year. The Champion Mine is offered to the company at 30,000, on the condition of an immediate payment of 10,000, in cash, 10,000, in six months, and 10,000, in one year, with a rebate of 2000, if the whole of the purchase money is now paid. The particulars of these two properties have been under consideration by the directors for some months past, and they instructed the company's agents to make a full investigation into all the circumstances connected with them, and to test the statements and reports supplied by the vendors. The shareholders were fully informed at the last annual meeting of the reasons which rendered it so desirable to build a mill, or to purchase one, but the possibility of obtaining a property so admirably suited for our requirements as the mill property now secured was not then known to the board.

The reports and opinions on the Champion Mine have been verified on behalf of the company, and the directors consider the terms favourable. He reports, moreover, that since the mine was bonded to the company's great improvement has taken place in the width and quality of the lode, and on Monday a telegram was received from him—he having been appointed to see that the vendors continued the workings on the conditions specified, that of leaving the reserves intact—in which he says:—"Champion extensive property, almost intact, masterly fissure vein opening out well, shaft going down in good pay lode, in winze at bottom of 540 worth 8500 dollars per fathom; with suitable transport to mill, in six months can give 100 tons ore per day. Donaldson reserves 850 tons smelting ore, 5000 tons good concentrating, and 4000 low grade; all ends and shaft yield mineral." It will be seen that the measured reserves in the Donaldson already exceed the estimate of Mr. Thomas Rickard. The board fully intended bringing this important question before you at an earlier date, but as they fully expected that Mr. Thomas Rickard would be in London by Sept. 10, and that he would bring his written report with him, and be able to attend the contemplated meeting and add his personal testimony, they considered this well worth waiting for. They now learn that he has been detained by important business in America, and cannot be here in time. The report of the meeting will be published in next week's Mining Journal.

Messrs. HARRINGTON, HORAN, AND Co. (Sept. 15) report—Chili copper charters for the first part of this month are not yet to hand but are hourly expected. During the past fortnight Chili bars have advanced in value from 67½ to 68½, 10s. on the spot, and 68½ to 69½, 10s. three months prompt. The market to-day is at its best, with very few sellers. The sales of furnace material comprise—At Liverpool, 1600 tons Quebrada ore at 13s. 6d., 60 tons Florence ore (rich produce) at 14s., 75 tons Italian ore at 13s. 6d., and 60 tons at 13s. 7½d. At Swansea, about 500 tons Chili regulus to arrive per Maxima, at 14s. 3d., and 320 tons Berhaven ore at 12s. 4d. Per day—about 845 tons Bullion at 14s., 50 tons Aljustrel at 14s., and 50 tons (seconds) at 13s. 9d., about 1300 tons Rio Tinto and 50 tons English (Sellers works) at 14s. 3d., and 130 tons Rio Tinto matte at 14s. per unit. Import of Chili copper during the past fortnight 911 tons fine, against 570 tons fine same time last year; delivery 1431 tons fine, against 1308 tons fine; import of other copper 1078 tons fine against 546 tons fine same time last year; delivery 1847 tons fine, against 1500 tons fine. Arrivals here during the fortnight of West Coast, S.A., produce—Araucania, from Valparaiso, 255 tons bars, 170 tons ingots; Sigmet, from Papudo, 310 tons regulus; Arequipa, from Valparaiso, 135 tons regulus. At Swansea, Ianthe, from Chancal and Huasco, 634 tons regulus. Stocks of copper (Chilian and Bolivian) in first and second hands, likely to be available, we estimate at—

	Ores.	Regulus.	Bars.	Ingots.	Barilla.
Liverpool	—	1190	14,080	583	—
Swansea	—	3,031	5,800	178	—
Total	—	4,221	19,880	761	—

Representing about 22,620 tons fine copper, against 23,140 tons 31st ult.; 25,308 tons Sept. 15, 1881; 33,882 tons Sept. 15, 1880; 32,339 tons Sept. 15, 1879. Stock of copper contained in other foreign ore and Spanish precipitate, 1688 tons fine, against 520 tons Sept. 15, 1881. Stock of Chili bars and ingots in Havre, 2805 tons fine, against 4005 tons Sept. 15, 1881. Stock of Coro Coro Barilla in

Havre, 15 tons fine, against 545 tons Sept. 15, 1881. Stock of copper other than Chili in Havre, 285 tons fine, against 1220 tons Sept. 15, 1881. Stock of Chili copper affoot and chartered for to date, 11,850 tons fine, against 9200 tons Sept. 15, 1881. Stock of foreign copper in London, chiefly Australian, 7346 tons fine, against 8785 tons Sept. 15, 1881. According to the Board of Trade Returns the total imports and exports into and from this country for the first eight months of the following years were—

	1880.	1881.	1882.
Copper in ores	8,595	9,105	8,583
Copper regulus and precipitate	18,021	18,489	18,208
Bars, cake, and ingots	25,397	20,004	22,642
In pyrites, estimated	12,006	9,558	11,152
Total	64,019	57,156	60,585
Exports			
English copper—wrought and unwrought	20,274	21,823	18,200
Foreign copper—unwrought	10,475	9,395	7,881
Yellow metal	10,778	9,745	12,326
Total	41,527	40,763	38,407

REPORT OF THE WHEELSRAKE LEAD MINE, DERBYSHIRE.

This mine is situated in Haddon fields, and in the immediate vicinity of that grand old baronial pile of Haddon Hall, and in close contiguity to the once-famed Alport Mines, and is of great antiquity, having been worked along with others in the neighbourhood by the Romans, as appears by legends on pieces of lead taken out of the old mine hillocks, three of which were deposited some years ago in the British Museum. The first was found on Cromford Moor in 1776, which was made in the reign of the Emperor Adrian. The second was found near Matlock Bank in 1783, which appears to have been the property of Lucius Arucianus Vericundus, lead merchant of London; and the third was found near Matlock in 1787, belonging to Tiberius Claudius. Their weights are, respectively, 173 lbs., 125 lbs., and 84 lbs., and as they are now in the British Museum an inspection is sufficient to prove they were thus prepared for articles of commerce. Mr. Pegge has conjectured that one of the pigs bears so early a date as the time of the Emperor Claudius, and if this were the fact it would go far to prove that the mines in the Peak were worked by the ancient Britons before the Roman invasion, as it is highly improbable that in so short a time after the landing of the Romans they should so far have subdued the natives in the central part of the island as to have discovered and worked these mines in so remote a district, or if, as other antiquarians have contended, this lead formed part of the tribute paid by the islanders themselves to the Roman Emperor, it would carry up the British to a very remote period. Be all this conjecture or reality it is still a fact that the mines have been worked from a very remote period down to the present day by each succeeding generation, as is very evident from the different methods that have been in use, and relics of which the present proprietors have found. During the last 15 years of the ages before either steel or powder was known, the ancient miner worked it from 15 ft. to 2 ft. wide, which enabled the miner to extract the ore without having occasion to cut away the rock.

The most recent account given in the old Barmaster's books is to the effect that about the year 1600 the great family of the Manners, ancestors of the present Duke of Rutland, and then residing at Haddon Hall, doubtless hearing the reports as bequeathed to that generation by the ancient miners of the vast quantities of lead remaining under water, the noble earl decided to give it a trial, so he caused a sough or level to be driven from the river, to enable him to drain the mine, and also to take the water from two 5-in. rag or chain pumps, which were fixed very ingeniously down in the mine. The motive power to work the same was obtained from a water-wheel. The column of water required was collected in the workings above, and conveyed in wooden launders to the top of the wheel, it then being carried away along with the water lifted by the pumps down the sough or level driven for the purpose; and having obtained large quantities of lead by the above means, was obliged to abandon it, owing to inefficient power to drain it below a certain depth. About 50 years ago another company was formed, and after spending 15,000, and failing to find the ore, abandoned it also. About 15 years ago the present proprietors commenced operations in clearing the old workings, and were not successful until 12 months ago they put down a large Pulsometer, which effectually keeps the water under, and drains it a depth of 20 yards below the old workings. The Pulsometer pump is certainly a marvel of engineering science. It discharges at the pump head 52,000 gals. of water per hour, and requiring scarcely any notice or attention whatever when the immense body of water to be discharged is considered, and the entire freedom from concussion known, it must become obvious to all scientific men that great praise is due to the talent, ingenuity, and perseverance of the inventors by the above means a large and valuable field of ore was laid bare, and during the eight months upwards of 1000 tons of ore have been brought to the surface by 16 men employed in the mine, and there is every prospect of the mine continuing to be as rich as ever in the future.

ELECTRICITY RIVALED BY METALLIC GAS.

Whilst the gas companies have been viewing with more or less dread the rapid progress which has been made in the development of the electric light for domestic and other use, they have not, we believe, been aware of the discovery of a new illuminating gas, which the inventor claims can be made at about one-tenth of the cost of coal gas, whilst it possesses vastly superior illuminating powers. The patentee, Mr. JOHN DIXON, has, it appears, spent the best days of his life in perfecting the invention, and has secured all necessary British and foreign patents. A limited liability company has been formed to work the patent, and with sufficient capital to do it successfully, large sums of money have been expended in developing and protecting the invention, until now patent rights have been secured in nearly every country of importance. Mr. Dixon claims for his invention the production of improved gas for illuminating purposes by the decomposition or dissolution of the component parts or constituents of metals, earths, acids, carbon, and hydrocarbon substances, the salts of alkalis, the dissolution of the substance being caused by heat. It has long been known that certain chemical substances, when strongly heated, produce flames of peculiar colours, which, when blended, produce a white light, and, acting on this knowledge, the inventor has realised what he says has been the dream of his life, and produced an apparatus capable of manufacturing and storing a gas, the result of the decomposition of the aforementioned chemicals, so that now he is prepared to supply a gas which, he says, is not only superior to but vastly cheaper than any supplied by other persons or companies in any part of the globe.

The model works erected in the Commercial-road, Liverpool, are the first in complete working order, and are capable of supplying gas for upwards of 1000 ordinary burners. The estimate of the inventor is that, whereas 1000 men will produce a given quantity of coal gas, three men under his system will obtain a like quantity of metallic gas, and give a superior light of at least six times the luminosity. In every conceivable way has the metallic gas been tested, and in some instances so crucial were the tests that the gas has been stored for upwards of 12 months, and its virtues were found to be unimpaired. Neither time nor weather seems to affect it. It has been found to travel any distance through the ordinary mains and pipes, and with the special advantage that neither condensation nor water is perceptible. Through the courtesy of Mr. Dixon we were given the opportunity of witnessing the operation of the works, and the tests applied in our presence. Two jets were lit in a dark room, one being the gas supplied by the Liverpool Gas Company, and the other the inventor's new gas. The gas company's burner was a No. 2, whilst Mr. Dixon's was a No. 0, and yet, when tested by a Wright's photometer or pressure gauge, the luminosity of the latter over the former was as six to one, affording, too, a clear, brilliant white light, and not at all fatiguing to the eyes. When the burners were reversed the light given by the No. 2 burner was intense indeed, putting in the shade altogether the gas company's light.

An important feature, too, in the consumption of new metallic gas is its purity, and the entire absence of any obnoxious sulphurous smell, vapour, or smoke. Tested with sheets of white paper, and held over the flame of each gas for a short time, the coal gas tinged the paper and left a slight deposit of soot, while none was perceptible in the other. Its cleanliness is as apparent as it is devoid of smell while burning. On applying the nose to the naked burner and the taps turned on, the new gas is not so unpleasant as the old, but its presence in case of a leak might be easily detected. Mr. Dixon affirms that if his gas was adopted he would be able to supply it almost anywhere at less—very much less—than the lowest rate charged by any gas company in existence to-day. In the manufacture of the new metallic gas retorts are employed similar in every respect to those of the ordinary gasworks. The retorts and their contents are then heated to not less than a "cherry" red heat. After generation in the retorts, the gas is led through a pipe, and the condensed vehicle is deposited in a receiver. The function of the receiver is to extract, as far as possible, the kerosene used in the retort supplier. The gas is subsequently taken to the purifier. Entering the purifier at the bottom and issuing from the top, the gas

is led to and stored in a gasometer of any suitable construction, from whence it is supplied through mains for general use. The gas is of a dry nature, and nearly incondensable, and is not affected by extreme cold. Not the least important or surprising advantage of this gas is the fact that Mr. Dixon is actually able to obtain or recover the vehicle, such as kerosene, used in the generation of his illuminating gas, and afterwards distilling it, he re-uses it to generate more of the gas for consumption. The residue when practically discarded for gas purposes can be turned into good account, and aniline colours, benzol, ammonia, carbon, and a host of other valuable products obtained by further manufacture. After making the gas, Mr. Dixon drives his machinery with it, and at less cost than if he used coal in the raising of steam in his boilers.

UTILISATION OF PHOSPHATIC METALLIC SLAGS.

The presence of phosphor in metallic slags has usually been considered objectionable, but it is now proposed by Mr. G. RECOUR, of Liège, to utilise them by extracting from them in a commercial form the metallic oxides and phosphoric acid which they contain. This process is specially applicable to the treatment of the slags produced in dephosphorising iron either in a Bessemer converter or in a reverberatory furnace, or the Thomas-Gilchrist process, or in puddling and reheating furnaces. The first operation consists of a reducing melting, conducted by preference in a tank furnace, a cupola, or a blast furnace, with a view of concentrating into a phosphatic matt almost all of the iron, the manganese, and the phosphorus of the slag. In order best to attain this end, the slags are assorted so as to ensure the decomposition of the phosphate of lime which they may contain by a suitable proportion of silica, forming a slag containing about 30 to 40 per cent. of silica, or else silicious matters are added so as to realise these conditions. When circumstances render it economical, it is found advantageous to introduce the silica necessary for the treatment of the basic slags of dephosphorisation (which contains an excess of lime) by putting puddling slags (which contain an excess of silica) into the melting bath. It is advantageous to charge the slags in as finely divided a state as to determine the reduction of the metals and phosphoric acid. This state of division can often be obtained by granulating the melted slags in water. The tank furnace should be kept very hot during working, so as to ensure the reduction of the phosphoric acid and manganese, as in the manufacture of ferro-manganese or magnetic iron. The phosphatic matt obtained is run into masses as small as possible, or, better still, is granulated in water, so as to facilitate its ulterior treatment by wet process.

This matt is then treated with sulphuric or hydrochloric acid in receptacles as little attackable by these acids as possible (stone, brick, earthenware, wood, lead, with the joints coated or impregnated with tar or resin) under the best conditions of pressure and temperature which experience determines, a steam jet allowing the temperature to be raised at will, and even the pressure by working in a closed vessel. In the latter case the receptacle should be of iron lined with the unattackable materials indicated above. The attack of the matt by the acids gives rise to a disengagement of hydrogen gas and phosphoretted hydrogen, which are conducted by a pipe to a series of burners placed so as to heat a small reverberatory or combustion furnace. At the end of this furnace is a chimney leading into the top of a condensing column formed of descending pipes cooled on the outside by water or the surrounding air, or by a spray inside. The hydrogen gas and the phosphoretted hydrogen burn, producing steam and phosphoric acid, which are drawn into the condensing column, and are collected at the bottom in the form of aqueous solution of phosphoric acid. This solution is concentrated by evaporation, and the phosphoric acid so obtained forms a commercial product of great value suitable for the manufacture of phosphorus for matches, &c., a product which at present is only known in laboratories.

The matt dissolved by the acids gives rise to a solution of chloride or sulphate of iron and manganese more or less pure, and which may contain in the form of acid phosphate a greater or less proportion of phosphorus, according to the more or less oxidising conditions which existed during the attack of the matt. If the solution was made with hydrochloric acid the iron and manganese are precipitated either together or separately in the state of oxide simply by the addition of lime in excess of a measured quantity of carbonate of lime (chalk) may first be added. In place of lime it is found advantageous to employ when available basic refinery slags finely ground, and containing an excess of lime. Under these conditions the oxides of iron and manganese and the phosphoric acid of these slags are added to the precipitated oxide and phosphate of iron, and thus avoid the cost of concentration of the corresponding matt. The phosphoric acid is precipitated in the state of basic phosphate of iron accompanied by the oxide of that metal. To effect the separation of these two products, and to obtain directly the phosphoric acid in a convenient form for chemical manures, the ferro-phosphate precipitate is mixed with commercial sulphate of potash, and the mixture is calcined to a red heat in a reverberatory furnace. The calcined mass is then treated with water, which leaves an insoluble residue of oxide of iron, and dissolves the phosphate of potash, which is easily separable by evaporation or crystallisation.

The phosphate of potash thus obtained constitutes a new commercial product applicable directly as a manure with or without mixture with lime or other substance or manure ore saleable to manufacturers of chemical manures according to the proportion of its two elements, phosphoric acid and potash. If under certain circumstances it is judged to be preferable to produce the phosphoric acid in the form of precipitated phosphate of lime, it suffices to add lime to the phosphate of potash, and to evaporate to dryness the decanted or precipitated solution so as to obtain the potash in the caustic state. Sulphate of soda may in the last case be substituted for sulphate of potash. The precipitates of the oxides of iron and manganese obtained mixed or separate as has been described above are sold to manufacturers producing iron, or speigleisen, or ferro-manganese for well known uses (glass for painting, iron minium rouge for polishing, glass makers' soap, linings for puddling furnaces, and so on). If sulphuric acid has been used for the solution of the matt, then the greater part of the phosphorus will have been obtained in the form of phosphoric acid, and the solution will only contain a proportion too small to justify the cost of a special treatment to separate it.

A part of the iron can then be obtained either by crystallisation in the state of sulphate (green coppers of commerce), or the two sulphates of iron and manganese obtained by evaporation to dryness may be decomposed by heat by calcining them in a closed vessel communicating with a suitable condensing apparatus, as in the Nordhausen manufacture of sulphuric acid, or in a reverberatory or muffle furnace communicating with lead chambers, thus recovering the acid used in the treatment of the phosphatic matt. The local economical conditions as to the price of the acids and the value of products obtained will determine which of the above described methods is to be preferred. The decomposition of the granulated or pulverised matt of phosphoretted iron can also be effected by a current of superheated steam, or of hydrochloric acid gas, or of gaseous chlorine. In this latter case the chloride of phosphorus produced is decomposed by water ultimately into phosphoric acid and hydrochloric acid, which is separated by evaporation or distillation, phosphoric acid remaining fixed.

MINING ENTERPRISE IN THE PYRENEES.—For some time past it has been well known that in the Pyrenean Departments of France there exists an extensive field for mining enterprise, and it is not doubted that with the judicious application of capital and economic management very satisfactory profits may be realised. Adopting this view a syndicate is now being formed to purchase an extensive mining property in the Bases Pyrenees, 11 hours from Bayonne, and as the mines are favourably reported upon and contracts have been actually made for disposing of the produce, there appears to be full justification for anticipating highly profitable results. The advertisement will be found in another column.

Lectures on Practical Mining in Germany.

CLAUSTHAL MINING SCHOOL NOTES—No. CCII.*

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(d)—SAFETY CATCHES, WITH ECCENTRICS.—The first of these to be brought into practical use is that invented by Messrs. White and Grant. At the upper end of the cage a strong plate runs across from one conductor to the other, having a cross or T-piece at each end. Parallel to this plate are two round rods or axles, one on each side, which pass through bearings in the end cross pieces. To the ends of these rods are fixed the toothed eccentrics, which are on the outside of the end cross pieces, and of which there are thus two to each conductor, one on each side of the conductor. At the opposite ends a short lever is keyed to each of the round rods, the free end of each lever being connected by a couple of links to a short bolt, which passes through the centre plate first mentioned, and through the middle of a conical buffer spring, the base of which bears against the opposite side of the centre plate. A nut and washer secure the bolts at the small end of the conical spring. The tension of the spring tends to keep the round rod in such a position that the shortest radius of each eccentric is perpendicular to the conductors; this portion of the eccentric is often made straight so as to form a guide shoe for the cage, though it is much to be preferred to form the guide shoes independently of the safety catch arrangements, and to have them perfectly rigid. In the centre of each round rod, and keyed thereto, is a chain grooved pulley, to one part of which the end of a coupling chain is attached, the opposite end being fixed to the ring attached to the shackle of the winding rope. When the cage is at rest at the bottom of the shaft, or on the fallers at the top, and the winding rope slack, the tension of the springs pull round the axles, so that the coupling chains are partially coiled round their respective pulleys. When the cage is raised the coupling chains are drawn tight, partially rotating the axles and compressing the springs by means of the levers and bolts above mentioned, and bringing the eccentrics, as before stated, with their shortest radii perpendicular to the conductors. When the rope breaks the springs rotate the axles, and with them the eccentrics so far as to bring the teeth of the latter into contact with the conductors, the weight of the cage continues the rotation so as to cause the eccentrics to grip the conductors more firmly. In order to prevent the teeth from stripping the conductors they should not be longer than $\frac{1}{2}$ in. to $\frac{3}{4}$ in. In some cases the eccentrics are formed of three or four eccentric discs, connected together so that the teeth of one disc are set respectively a little in advance or behind those of the adjoining discs. The variations in the different safety catch arrangements are chiefly in the moving and intermediate parts, and not in the eccentrics themselves.

The following safety catch arrangement, invented by Hohendahl, is employed at the ironstone mines at New Essen, Westphalia. The eccentrics, as in the case of White and Grant's arrangement, are keyed on the ends of two parallel rods or axles. In the centre of each of these rods, however, a short lever is keyed; the loose end of each lever is connected by a short link, curved at its lower end to an horizontal cross head. The two connecting links are attached to the opposite ends of the common cross head; to the centre of this cross head is attached a vertical piston rod. The cylinder in which the piston moves is placed vertically above the centre of the cross head, and is firmly attached to the top frame of the cage. From this lower cross head two rods pass up vertically on the outside of the cylinder, and are attached at their upper end to a second cross head placed above the cylinder. To the centre of this upper cross head is attached a vertical suspension rod, the upper end of which screws into a swivel attached to the shackle of the winding rope. By means of a nut above and one below the lower part of the swivel the length of the attachment to the winding rope can be adjusted. Four strong coupling chains fixed at their upper ends to the ring attached to the shackle of the winding rope have their lower ends attached to the four corners of the cage. When the cage is suspended in the shaft, so that the four coupling chains are tight, the centre suspension rod is pulled up so far that the eccentrics, by means of the connections above described, are brought into such a position that the shortest radii of the eccentrics are perpendicular to the conductors, and the piston is raised up through four-fifths of its full stroke in the cylinder, so that the air is compressed into one-fifth of the space it occupied at first, giving a pressure to the square inch of four atmospheres, or 60 lbs. above the atmospheric pressure on the top of the piston. When a breakage of the winding rope occurs the compressed air forces down the piston, and by means of the connections above described it causes the rotation of the eccentrics so far as to bring the teeth of the latter into contact with the conductors, which grip the conductors in the manner stated in the description above given of White and Grant's safety catch. The piston is kept air tight by means of a leather packing pressed outwards against the sides of the cylinder by a strong steel spring. The upper side of the piston is covered with a layer of oil or water, which tends still further to keep the piston air tight. A tap is provided at the top of the cylinder to allow of the air being renewed should it be found necessary. The tap must then be opened and closed when the cage is at rest at the bottom, or on the fallers at the top of the shaft, the slack of the winding rope allowing the piston to be brought into its lowest position.

CALOW'S SAFETY CATCH.—The cage is suspended from the shackle of the winding rope by four coupling chains fixed to the corners of the cage. In the centre of the top of the cage is provided a cast-iron cylinder open at the bottom; within this cylinder is a spiral spring which rests upon the top of the cage; through this cylinder passes a second rod having a nut screwed on to the upper end, so that when the spring distends, raising the cylinder, the upper cover of the latter catches beneath the nut and raises the rod. The lower end of the rod is connected to two short levers, keyed in the centre of two parallel axles or round rods; to the ends of each of these are attached toothed eccentrics or segments, two being on opposite sides of each conductor. The tension of the spring is less than the weight of the cylinder, plus the friction of the moving parts, so that under ordinary conditions the spring is held compressed, part of the weight of the cylinder resting on the top of the cage. When the rope breaks and the cage begins to fall the cylinder relatively to the cage loses part of its weight. As soon as the acceleration of the descent equals the difference between the weight of the cast-iron cylinder and the tension of the spring, the latter begins to distend, and raises the central rod relatively to the cage, bringing the gripping eccentrics into play, and locking the cage fast to the conductors. It will be seen that this arrangement has the disadvantage that the cage is only caught after it has fallen some distance, and acquired a certain velocity, and consequently that the cage will always be caught with a greater or less shock. This distance, and the velocity which the cage has attained, depend principally on the amount of extension of the spring necessary to bring the gripping eccentrics into action, which is determined partly by the construction and partly by the tension of the spring, and by the ratio between the tension of the spring and the weight of the cylinder the greater this ratio the more rapidly will the safety catch act. An increase in this ratio, however, renders the apparatus liable to come into action when the acceleration of descent becomes great; it may thus possibly come into action without an actual breakage of the rope; if this takes place during the descent the cage may have acquired such a velocity that its sudden stoppage would throw the men out. The working of the apparatus, however, it will be seen, is but little influenced by the part of the rope where the rupture occurs, whether this is close to the cage or at some distance from it.

At the Altenberg Mine, near Aix-la-Chapelle, the following arrangement, designed by Krauss, is employed. The general arrangement of it is similar to that of White and Grant's, but india rubber springs

are used in place of steel spiral springs. Connected to the axles on which the eccentrics are placed are two wings, which, when the rope breaks, are released so that the wind catching beneath them open them out, rotating the axles, and assist the springs in bringing the eccentric grippers into action. The assistance which such an arrangement gives to the springs has the disadvantage of being later than is desirable.

Hamel's arrangement, which is designed to allow of springs having but a small tension being employed, combines both the use of toothed eccentrics and wedges. On each side of the cage, at the top and close to the conductor, but without touching, it is mounted an eccentric with flat roughened surface on movable bearings, which can slide to and from the conductors. On the ends of the axle of the eccentric, and outside the bearings, are fixed segments, from which chains or wire ropes pass down on each side of the conductor, and are attached at their lower ends to a wedge suspended immediately beneath the cage. The movable bearings above mentioned are pushed outwards by springs, and are also attached to rods passing through the centre of the springs. The opposite end of the rod is attached to a short chain or wire rope passing round a pulley fixed on the top of the cage, the other end of the rope being attached to a small cross piece on a vertical rod, the upper end of which is attached to the shackle on the winding rope. The cage is connected from the corners to the winding rope by four coupling chains, which, however, are not drawn tight before the vertical rod has pulled back the bearings of the axle of the eccentric so as to compress the springs. When the winding rope breaks the springs push forward the bearings so far that the eccentrics are brought into contact with the conductors, the friction between the two causes the former to rotate, and in so doing lifts the segments and raises the wedges (i.e., relatively to the cage), locking the cage fast to the conductors. The eccentrics themselves, which may be considered as circular wedges, can only press the conductors with the tension due to the springs, and consequently do not in themselves contribute much towards wedging the cage against the conductors unless the eccentricity is made so great that the bearings are pushed back so far as to come against a fixed stop. When this is the case, however, a limit is placed upon the distance to which the wedges can be raised, and hence, unless very carefully adjusted, this distance may be insufficient to raise the wedges into a position in which they will act to lock the cage. In normal position during winding the eccentrics have their smallest radii perpendicular to the conductors, and the guide shoes on the cage must be so fitted that the oscillations of the cage shall not bring the surface of the eccentrics into contact with conductors unless an actual rupture of the winding rope occurs.

AMALGAMATING AND EXTRACTING GOLD AND SILVER FROM THEIR ORES.

So much attention is just now being directed to the question of the profitable extraction of gold and silver from their ores that the description of every new process brought forward is read with general interest. The invention of Mr. L. F. GOWANS, of Cheapside, relates more especially to machinery used for amalgamating, or extracting by means of metallic mercury, the particles of gold contained in auriferous quartz, stamped or otherwise pulverised, or of silver from silver ores similarly reduced to powder. It has for its objects novel methods of constructing and arranging machinery or apparatus by means of which the metal to be extracted is brought into intimate contact with the mercury, so that every particle during its passage through the machine is necessarily brought into such contact with the mercury, and great saving of the latter as well as of the gold or silver which is to be extracted is effected, as compared with machinery or apparatus for such purpose as heretofore ordinarily constructed and used, in which a considerable part of the metal, especially the very minute particles, passes away from the machine without being detained by the mercury, and either escapes and is lost or has to be recovered by subsequent processes. In order to put the invention in operation, he takes a vertical hollow shaft of sufficient height, revolving in bearings formed upon or attached to a suitable framework or support of wood or other material, and having at its upper end a hopper into which the auriferous sand, powdered quartz, or other material to be treated is admitted, together with a sufficient quantity of water. The auriferous sand and water may be allowed to pass into the hopper directly from stamps or other pulverising machinery by which it has been reduced to powder, or it may be supplied gradually from any source by hand, or by elevators, endless screws, or other feeding mechanism of any of the ordinary well known kinds.

The vertical hollow shaft and hopper are set in revolution at the desired speed, which may be varied according to the character of the material being treated, by steam, water, or other convenient power. He prefers to drive it by means of a horizontal shaft set in motion by such power and revolving in bearings formed upon or attached to the framing which carries the vertical hollow shaft, one end of such horizontal shaft being fitted with a bevelled toothed wheel gearing into and driving a corresponding bevelled toothed pinion upon the vertical hollow shaft, and its other end being fitted with a pulley by which it is set in revolution. The weight of the hollow vertical shaft, and of the appliances hereinafter described which are attached to its lower end, is supported by a collar arranged at any convenient part of its length, preferably at its upper end, such collar resting upon a fixed support or bearing in which it revolves, preferably with the intervention of a sufficient number of steel rings or washers.

At the lower end of the hollow vertical shaft is fixed a block, preferably of cast-iron, having a vertical central opening at its upper part, which is fitted upon and attached to the shaft, the lower end of the opening communicating with a sufficient number (preferably four) of outlets curving down and outward, through which the sand and water pass out into a circular horizontal pan or dish, preferably of wrought-iron, which is supported upon a frame or foundation immediately below the hollow shaft. At the upper end of the hollow casting above described, where it is fitted upon the hollow shaft, is formed a collar, upon which is supported and fixed a horizontal muller or grinding plate, preferably of cast-iron, which is made in four or more segments bolted or keyed together, so that either of them can at any time be readily removed or replaced when desired. The bottom of each of these segments is provided with a flat copper plate, rivetted or otherwise fixed to it. A circular inclined or vertical flange is preferably formed upon the outer diameter of the segments, concentric with but of less diameter than the edge of the pan already described, so that an annular space is left between them.

The action of the apparatus is this:—The lower surface of the copper plates, which are amalgamated with mercury, being adjusted to revolve at a suitable distance, preferably about one inch and a half from the bottom of the pan, into which a sufficient quantity of mercury is placed, the vertical shaft, together with the copper bottomed segments, are set in revolution, a supply of auriferous sand and water being admitted down the vertical hollow shaft from the hopper above. By the pressure of the water the sand is pressed, not between the copper-plated muller and the mercury in the pan, but absolutely through the mercury in the latter and on the copper plates, and in this way it is impossible for any particle of gold to escape amalgamation provided the ore be crushed sufficiently fine. The sand from which the gold has been thus extracted passes from under the muller and is carried with the water over the edge of the pan in which the latter revolves. The muller being in segments, either segment can be readily removed or replaced when necessary.

Where auriferous or argentiferous ores are to be treated, in which the metal is coated or combined with mundic or substance which has no affinity for mercury, he uses the following process:—The ore being crushed or reduced to the necessary degree of fineness, either dry or being thoroughly dried after such crushing, he passes it in a dry state through the machinery or apparatus already described to the mercury, in which has been added, in the proportion of about 1 oz. to 4500 ozs. of mercury, the following composition. He heats mercury to a temperature of about 300°Fahrenheit, and to every 1000 ozs. he adds 17 ozs. of metallic sodium, in small particles at a time in order to avoid dangerous combustion, and he mixes the alloy in the above named proportions with the mercury in the pan of the apparatus,

The presence of the sodium in the mercury frees the particles of metals in the sand from their coating of mundic or other such substance as described, and ensures their thorough amalgamation whilst passing under the muller. He does not confine himself to the precise proportions of the materials named, which may be varied slightly to suit varying circumstances. Where the sand is passed dry through the machine or apparatus as described, it is not necessary that the vertical hollow shaft should be of such height as in the arrangement first described; and the hopper may be arranged immediately above the revolving hollow block to which the compound muller is attached, the sand being made to pass under the copper plates by the revolution of the latter, aided if necessary by revolving blades or screws by which it is forced down. The pan may in some cases be surrounded by a casing or jacket, steam or hot water being admitted into the space between, so that the mercury may be heated and kept at any desired temperature. The bottom of the muller may be provided with ribs or projections, or depressions, straight or curved, in order that every particle of the sand may more certainly be brought into contact with the mercury.

THE BARRIER-TOURVIEILLE ELECTRICAL ACCUMULATOR.

The electrical accumulators or secondary batteries heretofore constructed possess numerous disadvantages, which have, to a great extent, destroyed their practical utility, although they have been designed for extensive use as magazines of electricity to be employed in manufactures and otherwise for giving light, supplying power, and for other purposes. Such apparatus are however applicable for a variety of purposes, ranging from surgical operations to the propelling of tramway vehicles, and from the lighting of houses to the lighting of large establishments or places. The invention of Messrs. BARRIER and TOURVIEILLE DE LA VERNEDE, of Paris, is designed to improve and render practical the well-known Planté apparatus. They provide a ribbon or band of lead, which may be either smooth, channelled, perforated, or otherwise treated for giving to it as large a surface as possible. This band may be from $\frac{1}{2}$ centimetre to 4 centimetres in width, and from 1-10th to $\frac{1}{2}$ millimetre in thickness, but these dimensions may be varied according to circumstances. The said ribbon or band is manufactured from lead wire of the desired thickness, which is passed through rollers; it is made endless and coiled upon a reel or winder, which gives to the element the desired shape, such as circular, square, rectangular, triangular, or any other geometrical form or figure which experience may show to be desirable. Whilst being coiled the bands pass through a semi-liquid paste or composition, which becomes after several hours a strong and firm cement. This cement or mastic is composed of one part of platinised carbon, one part of litharge reduced to a fine powder, and one part of glycerine, these proportions being, however, subject to modification according to circumstances.

The platinised carbon is employed for two purposes, and has two effects—that is to say, in the first place it effectually prevents the coils of the lead bands or ribbons from actual contact with one another, and consequently permits the liquid to pass between each spiral, so that the greatest possible surface may be completely utilised. In the second place, it absorbs a considerable quantity of hydrogen, which in all the apparatus heretofore known has been set free and entirely lost. This cement or mastic has also the effect of opposing a resistance to the passage of the current during the time the apparatus is discharging, and acts, when it is being charged, in a very energetic manner, so as to become transformed into spongy lead.

Each of the improved elements is composed of four discs or pieces, of rectangular or other shape, arranged so that two of the pieces, forming the half of an element, are secured together by means of the cement or mastic. Each element is placed in a box of ebonite, stoneware, glass, or other suitable material, and united to the adjoining element for quantity or tension according to the use to which the battery is to be applied. Each half element is separated from the next one, either simply by means of a liquid or porous plate impervious to the attack of acid, and they may provide at the surface of each element, in the case of employing the porous plate, a layer of platinised carbon. When these elements have been made they subject them to the action of a bath of potash or of neutral acetate of lead. This improved battery or apparatus may be made in various forms and dimensions, and they may, if desirable, make use of platinised pumice or any oxide or salt of platinum; in place of the platinised carbon they may also use platinised lead, and add to the cement above described any suitable metallic filings. They may in place of the sulphuric acid ordinarily used in secondary batteries employ a solution of acetate or other salt of lead.

MANUFACTURE OF EXPLOSIVES.

Heretofore all explosive granulated powders containing nitro-cellulose, or other solid organic nitro-compounds, have been comparatively loose in texture and easily compressible, so that the ballistic effect of such powders, and the strain produced by their explosion upon the barrel of the gun, varied according to the degree of compression to which they were subjected in loading the cartridge or the gun. The object of the invention of Messrs. REID and JOHNSON, of Stowmarket, is to produce a powder of hard and uniform grain, the use of which is free from the irregularities due to the variations of pressure in loading cartridges and guns. In carrying out their invention they take explosive powders containing nitro-cellulose or other solid organic nitro-compounds which have been granulated by ordinary and well-known methods. They moisten the granulated powder with ethylic or methylic ethers or alcohols, or any mixture of these, whether with each other or with other liquids.

The amount and proportion of liquid required to saturate the granulated powder vary according to the size of the grains and the nature of their composition, but from 50 to 80 parts by volume of the liquid will in most cases be found sufficient to moisten 100 parts by volume of powder granulated in the usual manner. After the addition of the liquid the powder is dried, during which process the volatile portions may be recovered and afterwards used again. The grains, which adhere slightly to each other, are then separated by rubbing them through a sieve, and are ready for use. If necessary suitable substances which are soluble in the liquids which they employ may be added to them for the purpose of waterproofing the powder, modifying its explosive properties; but they have found that compounds of nitro-cellulose, which are hygroscopic when their texture is loose, do not absorb moisture when they have been hardened as described.

THE MICROPHONE AND FIRE-DAMP.—A new application of the microphone to the determination of the position of nodes and ventral segments in columns of vibrating air has been communicated to the Academy of Sciences by M. Lerra-Carpi. The microphone is mounted on an elastic membrane stretched over a little drum, and then lowered into the sounding pipe. When the apparatus came to a node, the telephone in circuit with the microphone gave out a rumbling sound, similar to that caused by an induced current. On the other hand, when the microphone passed a belly the sounds became very faint and rare, while at intermediate points they increased or diminished, according as the microphone sounder was brought nearer to a node or a belly. It is believed that the microphone may thus be made useful as a detector of fire-damp in mines. According to some observers such explosives are always preceded by undulations too feeble to be detected by the human ear, but these latter would be revealed by a system of microphones placed at intervals through the mine.

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* Being Notes on a Course of Lectures on Mining, delivered by Herr Bergström, Dr. von GODECKE, Director of the Royal Bergakademie, Clausthal, the Harz, North Germany.

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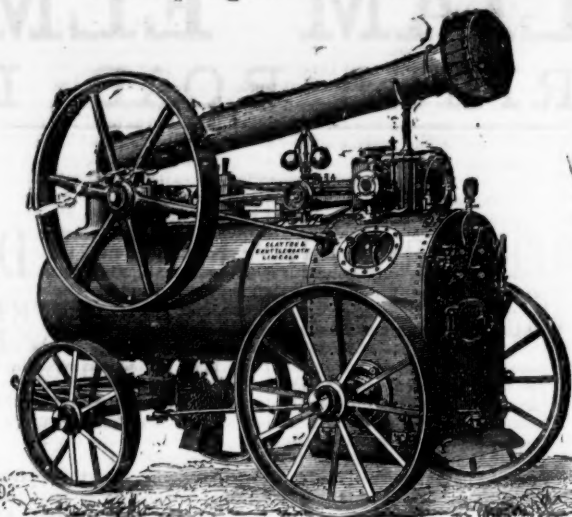
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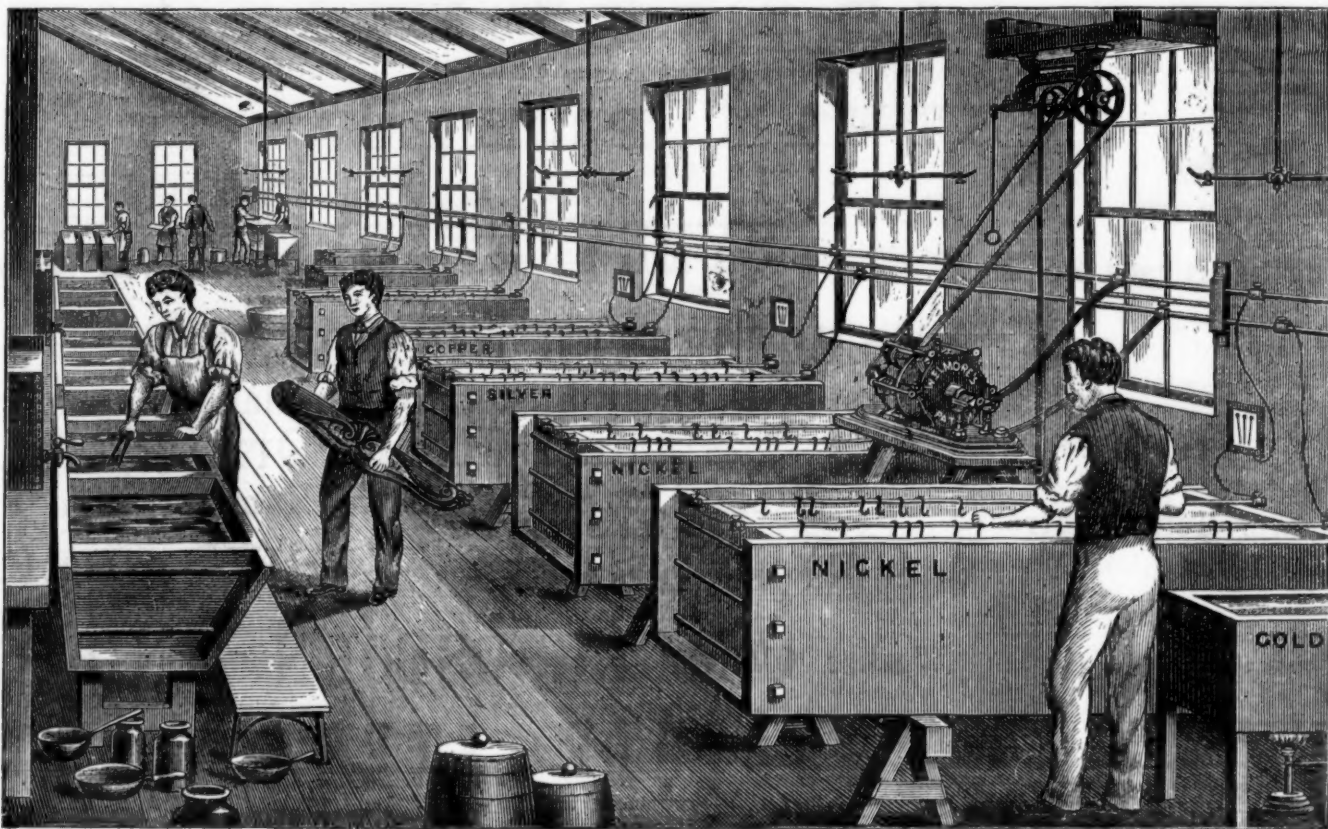
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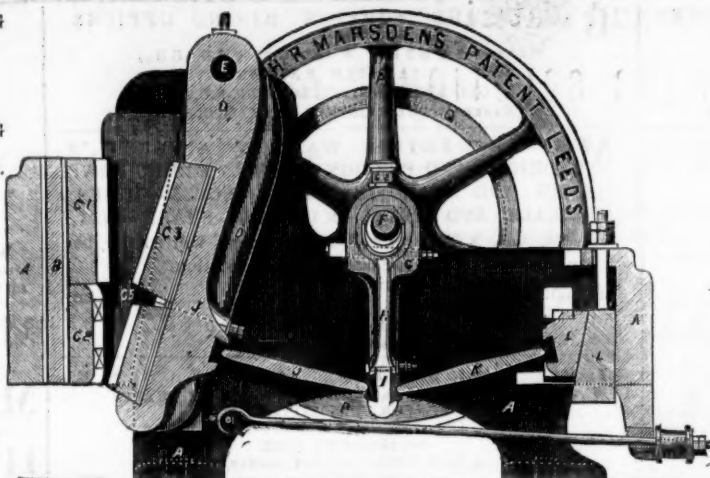
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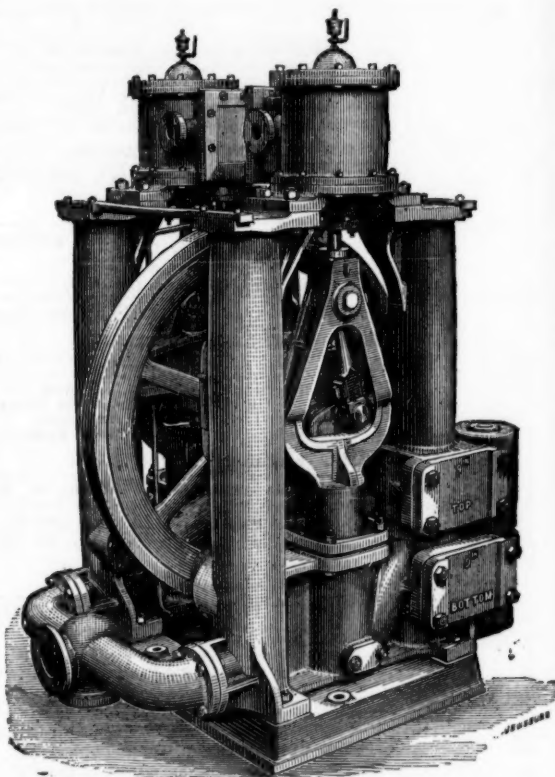
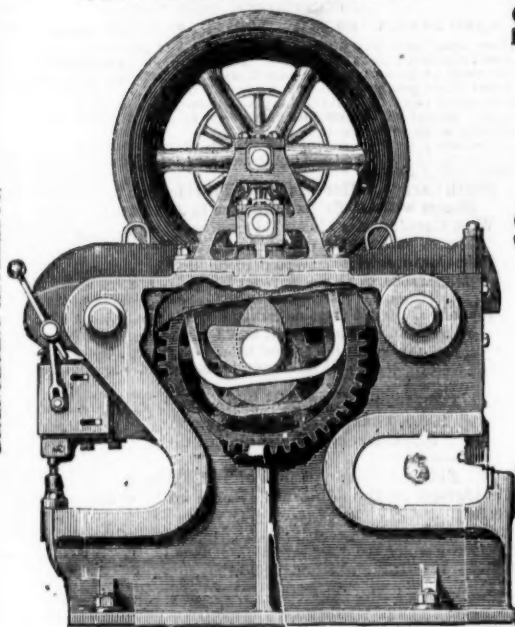
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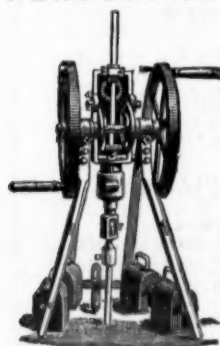
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